

ORDER NO. MKE0101000C1

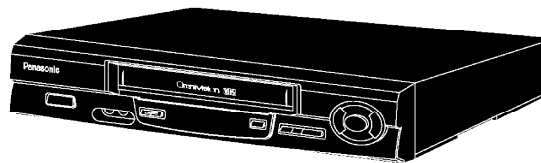
B3

# Service Manual

Video Cassette Recorder

**Omnivision** **VHS**

PVQ-V201 / PV-V4021 / PV-V4021-K / VHQ-401 / VHQ-41M / PV-V4511 / PV-V4521 / PV-V4521A / PV-V4521-K / VHQ-451 / PV-V4611



## SPECIFICATIONS

ITEM	SPECIFICATION	1	2	3	4	ITEM	SPECIFICATION	1	2	3	4
Power	Source: 120 V AC±12 V AC, 60 Hz±3 Hz	○	○	○	○	RF Out	CH 3/CH 4 switchable 72 dBμ (open voltage) 75 Ω unbalanced	○	○	○	○
	Consumption: Approx. 18 W (Power on), Approx. 2.5 W (Power off) Approx. 23 W (Power on), Approx. 3.0 W (Power off)	○	○	-	-						
Video	Head: 2 rotary heads helical scanning system 4 rotary heads helical scanning system	○	○	-	-	Tuner	Broadcast Channels: VHF 2-13, UHF 14-69 CABLE Channels: Midband A through I (14-22) Superband J through W (23-36) Hyperband AA-EEE (37-64) Lowband A-5-A-1 (95-99) Special CABLE channel 5A (01) Ultraband 65-94, 100-125	○	○	○	○
	Input Level: VIDEO IN Jack (Phono type) 1.0 Vp-p 75 Ω unbalanced Output Level: VIDEO OUT Jack (Phono type) 1.0 Vp-p 75 Ω unbalanced Signal-to-Noise Ratio: SP: more than 43 dB LP/SLP: more than 41 dB	○	○	○	○						
	Horizontal Resolution: Color/Monochrome: more: SP :230 lines LP/SLP :220 lines	○	○	○	○						
						Video Signal	EIA Standard (525 lines, 60 fields) NTSC Color Signal	○	○	○	○
Audio	Head: Normal Mono : 1 stationary head Hi-Fi Stereo : 2 rotary heads	○	○	○	○	Tape Speed	SP: 1-5/16 i.p.s (33.35 mm/s), LP: 21/32 i.p.s (16.67 mm/s), SLP: 7/16 i.p.s (11.12 mm/s) Record/Playback Time: 8 hr. with 160 min. type tape used in SLP mode FF/REW Time: Less than 2-1/2 min. (120 min. type tape)	○	○	○	○
	Input Level: AUDIO IN Jack (Phono type) -10 dBv 50 kΩ unbalanced Output Level: AUDIO OUT Jack (Phono type) -8 dBv 600 Ω unbalanced AUDIO OUT Jack (Phono type) -8 dBv 1 kΩ unbalanced	○	○	○	○						
	Frequency Response: Normal Mono: SP: 100 Hz-8 kHz LP: 100 Hz-6 kHz SLP: 100 Hz-5 kHz Hi-Fi Stereo: SP/LP/SLP: 20 Hz-20 kHz	○	○	○	○	Tape Format	Tape width 12.7 mm (1/2 inch) high density tape	○	○	○	○
	Signal-to-Noise Ratio: Normal Mono: SP: more than 42 dB LP/SLP: more than 40 dB Hi-Fi Stereo: SP/LP/SLP: more than 60 dB	○	○	○	○	Operating Condition	5 °C-40 °C (41 °F-104 °F) (Temperature) 10 %-75 % (Humidity)	○	○	○	○
	Wow and Flutter: Normal Mono: SP: Less than 0.2 % WRMS LP: Less than 0.3 % WRMS SLP: Less than 0.4 % WRMS Hi-Fi Stereo: Less than 0.015 % WRMS	○	○	○	○	Dimension (W x H x D)	360 mm x 93 mm x 242 mm (14-3/16 inch x 3-11/16 inch x 9-9/16 inch) 430 mm x 98 mm x 242 mm (16-15/16 inch x 3-7/8 inch x 9-9/16 inch)	○	○	○	-
		○	○	○	○	Weight	2.5 kg (5.5 lbs.) 2.7 kg (6.0 lbs.)	○	○	○	○
		○	○	○	○						
		○	○	○	○						

1. PVQ-V201
2. PV-V4021/PV-V4021-K/VHQ-401/VHQ-41M
3. PV-V4511/PV-V4521/PV-V4521A/PV-V4521-K/VHQ-451
4. PV-V4611

Weight and dimensions shown are approximate.  
Designs and specifications are subject to change without notice.

## **WARNING**

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

**Panasonic®/Quasar®**

## 1. MODEL NUMBER INDICATION

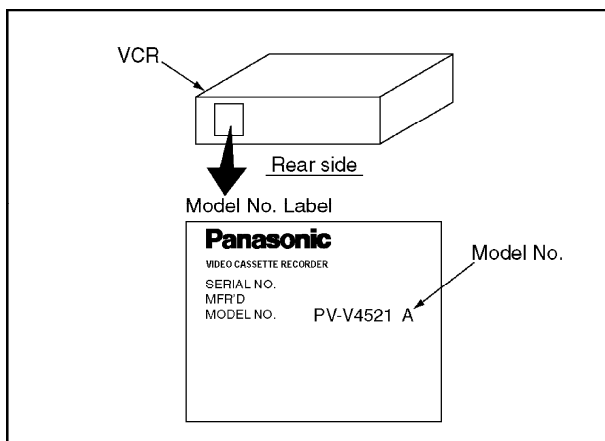
Use Marks shown in the chart below to distinguish the different models included in this Service Manual.

MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N
Not Used	Z

### **Note:**

Refer to Item 3 of Schematic Diagram Notes of Schematic Diagram and Circuit Board Layout Notes, for mark "Z."

The Model number is indicated on the **Model No. Label** which is located on the rear side of the Cabinet.



Differences between PV-V4521 and PV-V4521A are as below.

- Cylinder Unit (Ref. No. 11)
- Grounding Plate Unit (Ref. No. 57)
- Screw (Ref. No. 430)
- Flexible Flat Cable (Ref. No. 718)

### **- Main C.B.A. (Ref. No. E10)**

When ordering these, be sure to confirm the model number printed on the Model No. Label and order the proper parts according to the replacement parts list.

## **2. SAFETY PRECAUTIONS**

### **GENERAL GUIDELINES**

#### **1. IMPORTANT SAFETY NOTICE**

There are special components used in this equipment which are important for safety. These parts are marked by  $\triangle$  in the Schematic Diagrams, Circuit Board Layout, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

- 2. An Isolation Transformer should always be used during the servicing of VCR whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect VCR from being damaged by accidental shorting that may occur during servicing.**
- 3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.**
- 4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.**
- 5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.**

#### **LEAKAGE CURRENT COLD CHECK**

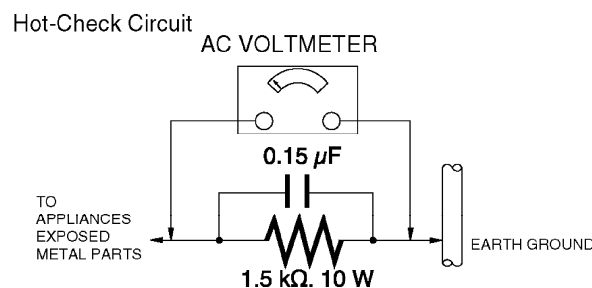
- 1. Unplug the AC cord and connect a jumper between the two prongs on the plug.**
- 2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1 M  $\Omega$  and 5.2 M  $\Omega$ . When the exposed metal does not have a return path to the chassis, the reading must be infinity.**

#### **LEAKAGE CURRENT HOT CHECK**

(See figure 1.)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a  $1.5\text{ k}\Omega$ ,  $10\text{ W}$  resistor, in parallel with a  $0.15\text{ }\mu\text{F}$  capacitor, between each exposed metallic part on the set and a good earth ground, as shown in figure 1.
3. Use an AC voltmeter, with  $1\text{ k}\Omega/\text{V}$  or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed  $0.75\text{ V RMS}$ . A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks. Leakage current must not exceed  $1/2\text{ mA}$ . In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

Figure 1



### 3. PREVENTION OF ELECTRO-STATIC DISCHARGE (ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits, some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should

remove electrostatic charge for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an antistatic solder removal device. Some solder removal devices not classified as "antistatic (ESD protected)" can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.  
**CAUTION:** Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

"NOTE to CATV system installer:

This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical."

## **4. OPERATION GUIDE**

## **5. SERVICE NOTES (PLEASE READ)**

### **5.1. SERVICE NOTES**

#### **5.1.1. SIMPLIFIED FAULT FINDING DATA**

(With clock model in F.I.P.)

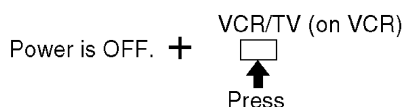
Simplified Self-Diagnostic System facilitates finding the cause of the fault. A 4 digit fault code will be

displayed in F.I.P.

The Simplified Fault finding data is stored in the Memory IC (IC6005). This data is cleared after it is displayed, and then the POWER button is pressed back on.

1. With power turned off, press VCR/TV button on VCR (for over 3 seconds if VCR is not in shut off condition).

Fig. 1-1



2. Fault code (4 digit number) will be displayed in F.I.P. as shown.

Fig. 1-2

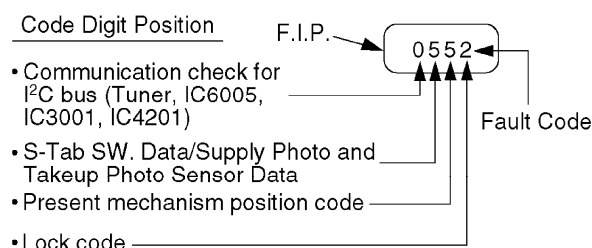


Fig. 1-3

Explanation of Codes	Code No.			
<b>Communication check for I<sup>2</sup>C bus (Tuner, IC6005, IC3001, IC4201)</b> (Refer to Fig. 1-4.)	0 F			
<b>S-Tab SW. Data/Supply Photo and Takeup Photo Sensor Data</b> (Refer to Fig. 1-5.)	1 8			
<b>Present Mechanism Position Code</b>  Mechanism Position is indicated. (Refer to Fig. 1-6.)		1 2 3 4 5 6 7 8 9 A B C D		
<b>Lock Code (See Note)</b> • VCR is not in shut-off condition. • Reel lock. • Cylinder lock. • Exceeds loading/unloading time. (Mechanism Lock) • Exceeds Cassette loading/unloading time. (Cassette Lock) Tape Unloading (direction) Tape Loading (direction)			0 1 2 3  1 2	

Fig. 1-4

Communication check for I <sup>2</sup> C bus (IC6001↔Tuner)	Communication check for I <sup>2</sup> C bus (IC6001↔IC6005)	Communication check for I <sup>2</sup> C bus (IC6001↔IC3001)	Communication check for I <sup>2</sup> C bus (IC6001↔IC4201)	Code No.
OK	OK	OK	OK	0
			NG	1*
	NG	NG	OK	2
			NG	3*
		OK	OK	4
			NG	5*
		NG	OK	6
			NG	7*
NG	OK	OK	OK	8
			NG	9*
		NG	OK	A
			NG	b*
	NG	OK	OK	C
			NG	d*
		NG	OK	E
			NG	F*

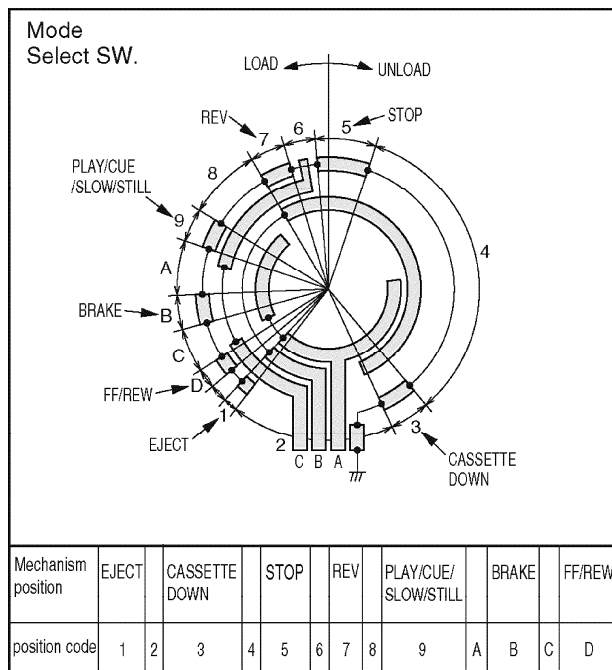
**Note:**

For Normal Audio (Mono) models, "Communication check for I<sup>2</sup>C bus (IC6001↔IC4201)" is ignored and even code Nos. alone (with\*) will not be displayed in F.I.P.

**Fig. 1-5**

S-Tab SW. condition	Supply Photo Sensor condition	Takeup Photo Sensor condition	Code No.
ON	OFF	OFF	1
	ON	OFF	2
	OFF	ON	3
	ON	ON	4
OFF	OFF	OFF	5
	ON	OFF	6
	OFF	ON	7
	ON	ON	8

**Fig. 1-6**

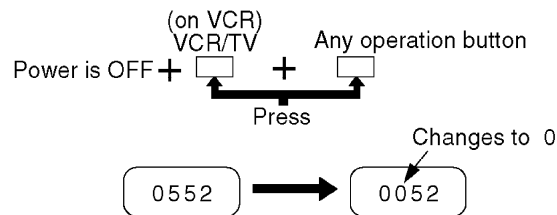


- While pressing VCR/TV button on VCR with power turned off, press any operation button on either VCR, or remote to detect that a key has

been pressed.

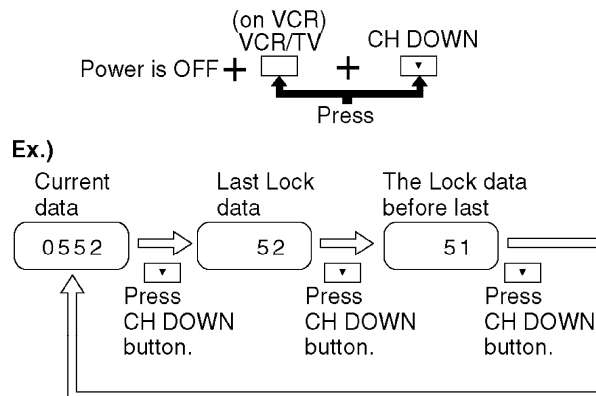
The 1st digit changes to "0" only when key is detected.

Fig. 1-7



4. When 1 to 4 listed in Lock code occurs, Lock data will be stored in the EEPROM IC (Current data, Last Lock data, and the Last Lock data before last). Lock data displayed in F.I.P. can be changed by pressing CH DOWN button.

Fig. 1-8



Note:

1. Lock data will be kept after the AC Cord is unplugged.
2. When 1 to 4 listed in Lock code occurs for the first time, the VCR does not go into VCR shut-off condition. If it occurs again within a minute, the VCR goes into VCR shut-off condition. Then, the VCR stops and all VCR function buttons except for power become non-operational.

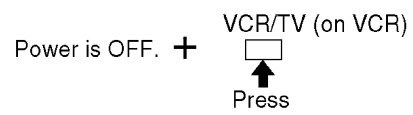
(Without clock model in F.I.P.)

Simplified Self-Diagnostic System facilitates finding the cause of the fault. LED will light up or flash in F.I.P.

The Simplified Fault finding data is stored in the Memory IC (IC6005). This data is cleared after it is displayed, and then the POWER button is pressed back on.

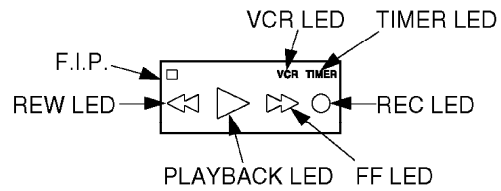
1. With power turned off, press VCR/TV button on VCR (for over 3 seconds if VCR is not in shut off condition).

Fig. 2-1


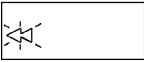

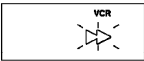
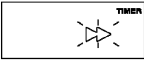
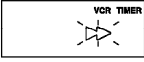
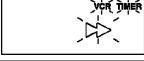
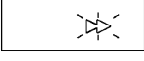



**2. Fault indication will be displayed in F.I.P. as shown.**

**Fig. 2-2**



**Fig. 2-3**

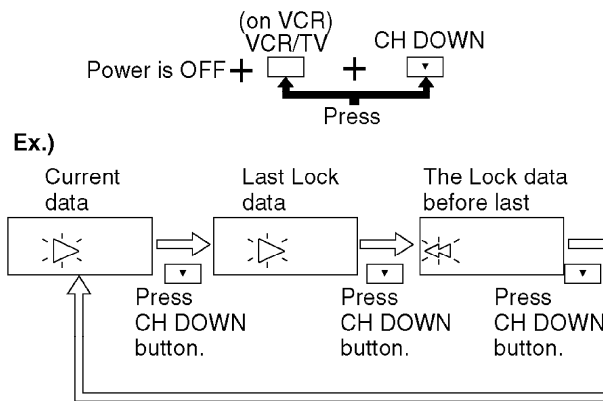
Information	LED
VCR is not in shut-off condition.	No LED is displayed. 
Reel lock.	REW LED flashes. 
Cylinder lock.	PLAYBACK LED flashes. 
<b>Exceeds loading/unloading time. (Mechanism Lock)</b> Mechanism Position is indicated by FF LED, VCR LED and TIMER LED.	
PLAY/CUE/STILL/SLOW	STOP FF LED flashes and VCR LED lights up. 
	FF LED flashes and TIMER LED lights up. 
	FF/REW FF LED flashes and VCR LED and TIMER LED light up. 
	REV FF LED, VCR LED and TIMER LED flash. 
	Other Only FF LED flashes. 
Exceeds Cassette loading/unloading time. (Cassette Lock)	REC LED flashes. 

**Note:**

Without clock model in F.I.P., Tape Unloading/Loading (direction) is not displayed.

**3. When Lock indication occurs, Lock data will be stored in the EEPROM IC (Current data, Last Lock data, and the Last Lock data before last). Lock data displayed in F.I.P. can be changed by pressing CH DOWN button.**

**Fig. 2-4**



**Note:**

1. Lock data will be kept after the AC Cord is unplugged.
2. When Lock indication occurs for the first time, the VCR does not go into VCR shut-off condition. If it occurs again within a minute, the VCR goes into VCR shut-off condition. Then, the VCR stops and all VCR function buttons except for power become non-operational.

#### 5.1.2. USAGE SCREEN MODE

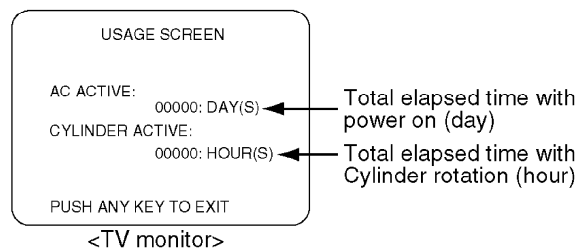
Function displayed on the TV monitor:

- the total elapsed "Power on" time (in days)
- the total elapsed "Cylinder rotation" time (in hours)

1. With power turned on and no cassette, press VCR/TV button on VCR and 7 key on remote together.

The USAGE SCREEN will be displayed on the TV Monitor.

**Fig. 3**



**Note:**

1. After replacing the Cylinder Unit, press COUNTER RESET button on remote in this mode. Only Total elapsed "Cylinder rotation" time (in hours) will be cleared to 0.
2. To release from Usage Screen Mode, press any operation button on VCR or insert a cassette tape in this mode. The VCR will return to normal operation mode.

#### 5.1.3. EEPROM IC (IC6005), MAIN C.B.A. REPLACEMENT NOTE

After replacing EEPROM IC (IC6005) or Main C.B.A., be sure to perform the "PG SHIFTER ADJUSTMENT" in ELECTRICAL ADJUSTMENT procedures.

#### 5.1.4. SERVICE POSITION

##### 5.1.4.1. Service Position

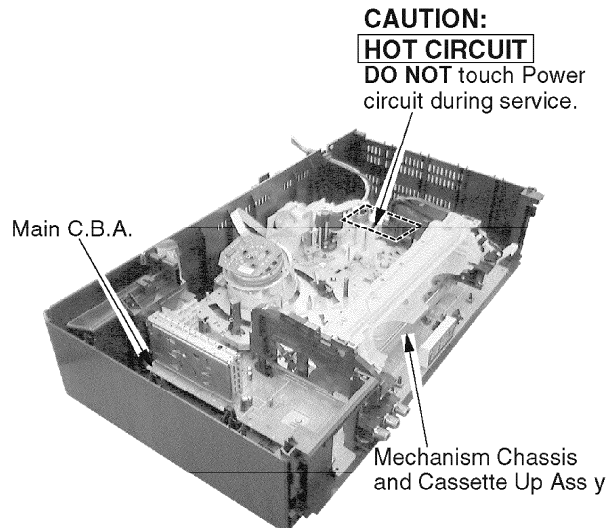
Service Position	Purpose
Service Position (1)	Mechanism check Mechanical adjustment Electrical adjustment
Service Position (2)	Main C.B.A. check

**CAUTION:**

**HOT CIRCUIT (Primary circuit) exists on the Main C.B.A.  
Use extreme care to prevent accidental shock when servicing.**

##### 5.1.4.1.1. Service Position (1)

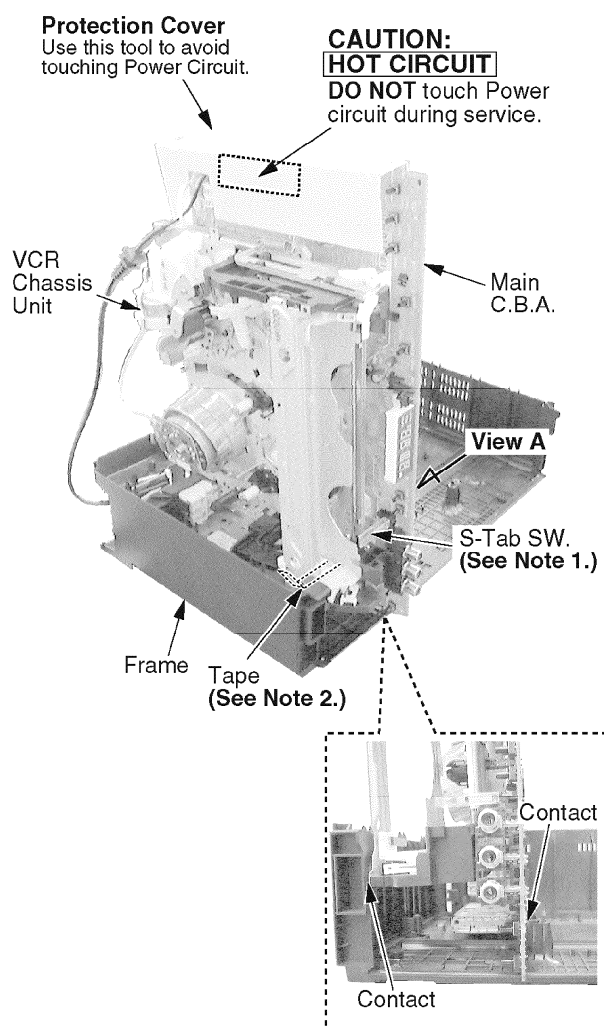
Fig. 4-1



##### 5.1.4.1.2. Service Position (2-1)

(Model: A, B, C, D, E, F, G, H, I, J, K, L)

Fig. 4-2-1

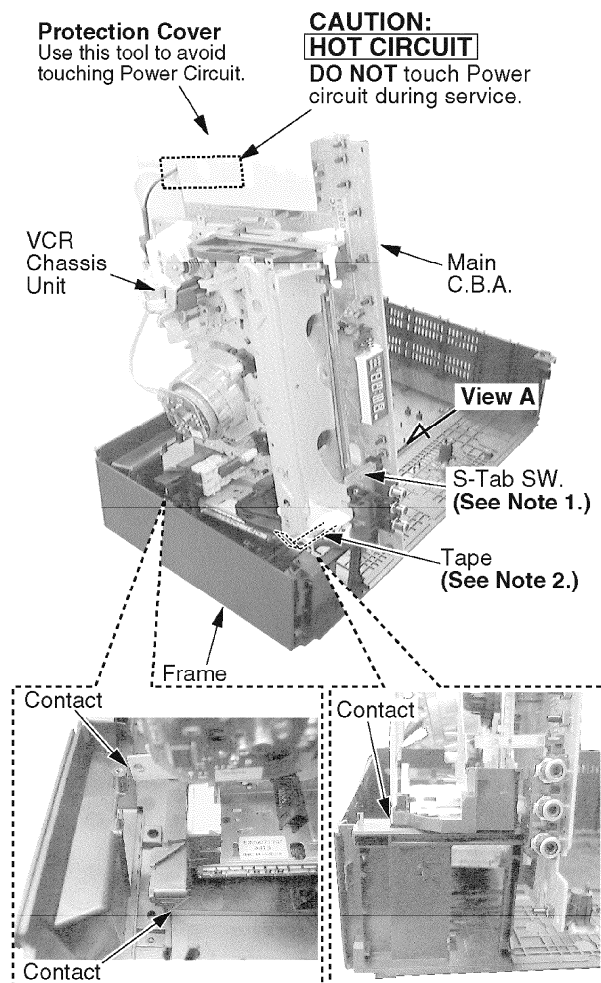


#### COMPARISON CHART OF MODELS & MARKS

MODEL	MARK	MODEL	MARK
PVQ-V201	A	PV-V4521	H
PV-V4021	B	PV-V4521A	I
PV-V4021-K	C	PV-V4521-K	J
-----	D	-----	K
VHQ-401	E	VHQ-451	L
VHQ-41M	F	PV-V4611	M
PV-V4511	G	-----	N

#### 5.1.4.1.3. Service Position (2-2) (Model: M, N)

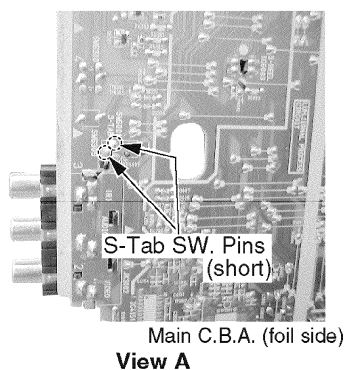
**Fig. 4-2-2**



**Note:**

1. It is possible that the S-Tab SW. may not work correctly in Service Position (2-1), (2-2). (Recording can not be done). In this case, short the S-Tab SW. Pins on the foil side of the Main C.B.A. to turn this SW. on.

**Fig. 4-3**

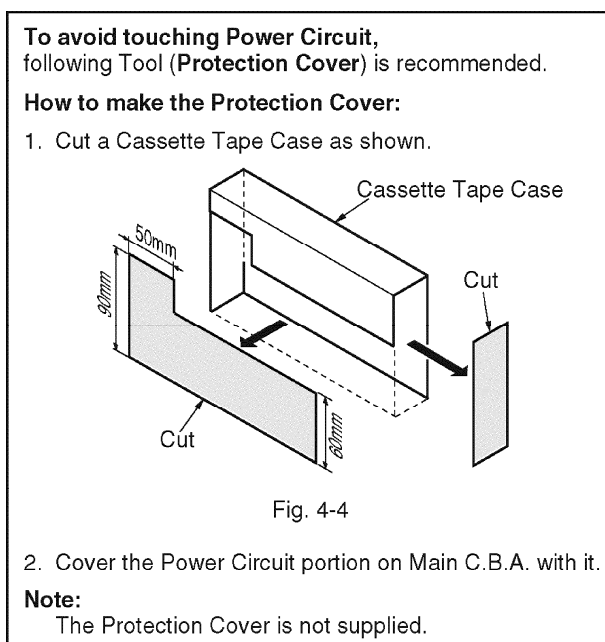


Alternative method:  
Cover the S-Tab SW. with masking tape.

2. Place the tape between the Cassette Up Ass'y and Main C.B.A. to get a

stability.

### 3. When disassembling/assembling, refer to "**CABINET SECTION**" in **DISASSEMBLY/ASSEMBLY PROCEDURES**.



#### COMPARISON CHART OF MODELS & MARKS

MODEL	MARK	MODEL	MARK
PVQ-V201	A	PV-V4521	H
PV-V4021	B	PV-V4521A	I
PV-V4021-K	C	PV-V4521-K	J
-----	D	-----	K
VHQ-401	E	VHQ-451	L
VHQ-41M	F	PV-V4611	M
PV-V4511	G	-----	N

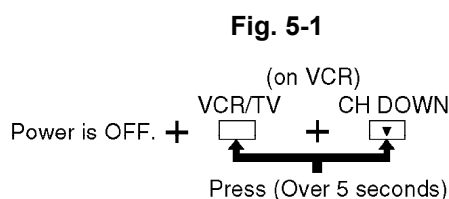
#### 5.1.5. HOT CIRCUIT

Primary circuit exists on the Main C.B.A.

This circuit is identified as "HOT" on the C.B.A. and in the Service Manual. Use extreme care to prevent accidental shock when servicing.

#### 5.1.6. SERVICE MODE

In order to inhibit detection of the Supply & Takeup Photo Transistors, Reel Sensor, and Cylinder Lock, press and hold VCR/TV button and CH DOWN buttons on VCR together over 5 seconds in power off condition.



The power comes on and the unit goes into service mode.

In this mode, Mechanism movement can be confirmed. When removing Cassette Up Ass'y, it can be confirmed without a cassette.

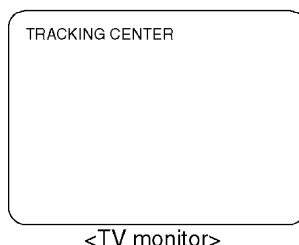
To release from this mode, press POWER button off or disconnect AC Plug.

#### 5.1.7. TRACKING CENTER MODE (TRACKING FIX AT CENTER)

Insert the Cassette tape. Set the unit into Service Mode. Play back the Cassette tape. Press PLAY button in Play back mode. "TRACKING CENTER" will be displayed on the TV monitor.

In this mode, the tracking is fixed at center. (Auto tracking and manual tracking functions are not operational.)

Fig. 5-2



To release from this mode, press PLAY or STOP button.

#### 5.1.8. CAUTION FOR INSTALLATION OF FRONT PANEL ASS'Y

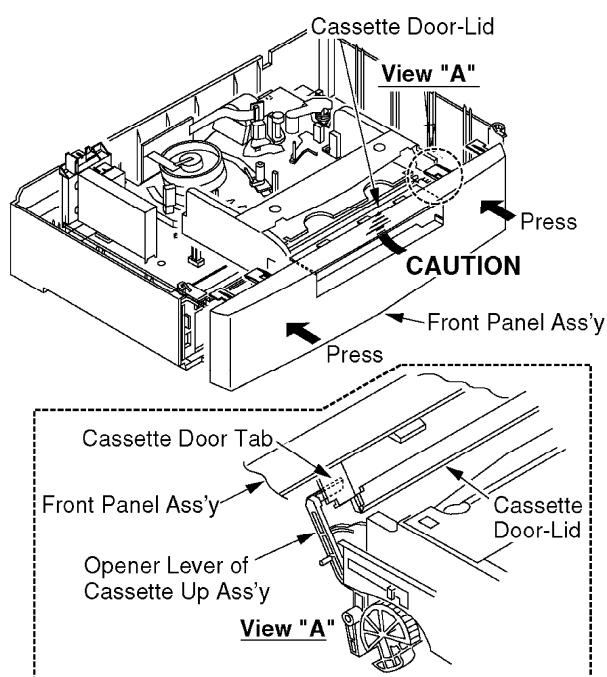
##### CAUTION:

**Opener Lever may be damaged when Front Panel Ass'y is installed, with Cassette Door-Lid of Front Panel Ass'y and Opener Lever of Cassette Up Ass'y set incorrectly.**

Install the Front Panel Ass'y as follows:

1. Swing the Cassette Door-Lid all the way open until the Cassette Door tab clears the Opener Lever.
2. Make sure that all locking tabs are aligned properly. Then, press the Front Panel straight in.

Fig. 6



### 5.1.9. METHOD FOR LOADING/UNLOADING OF MECHANISM

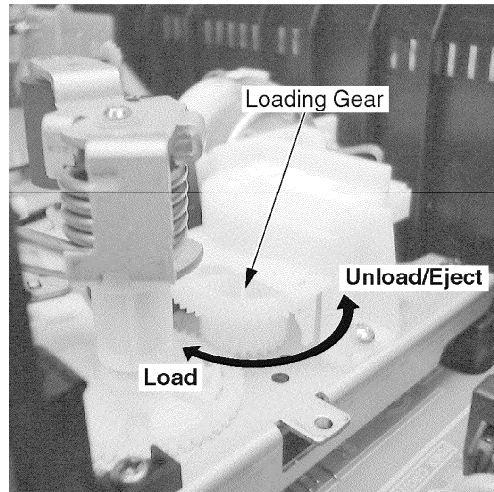
#### 5.1.9.1. (Manual Method)

Turn the Loading Gear clockwise (for loading) or counterclockwise (for unloading) using needlenose pliers etc.

Note:

**Do not use this method if Mechanism is jammed or locked.**

Fig. 7-1



#### 5.1.9.2. (Electrical Method)

Apply +10.0 V DC Power Supply to the Loading Motor terminals.

Loading

DC + to Portion "a," DC - to Portion "b"

Unloading

DC - to Portion "a," DC + to Portion "b"

CAUTION:

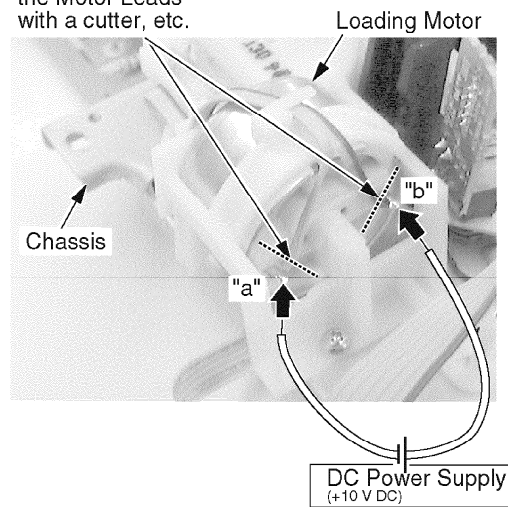
**Before applying DC Power Supply, be sure to cut the Motor Leads with a cutter, etc.**

**Otherwise, the Loading Motor Drive IC (IC2501) may be damaged.**

**When reconnecting the Motor Leads, solder at below / 320 °C for less than 3 seconds.**

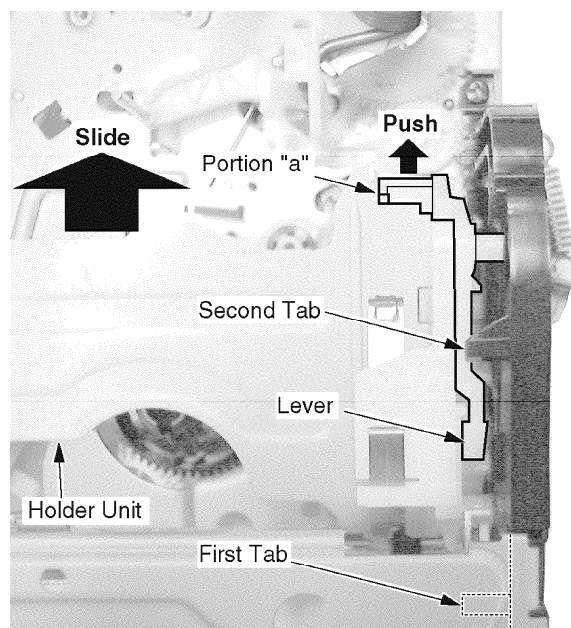
Fig. 7-2

**CAUTION:**  
Be sure to cut  
the Motor Leads  
with a cutter, etc.



When loading without a cassette, push Portion "a" on the Holder Unit of Cassette Up Ass'y so that the Lever clear the First Tab and Second Tab.

**Fig. 7-3**



#### 5.1.10. HOW TO REMOVE A JAMMED TAPE

**CAUTION:**

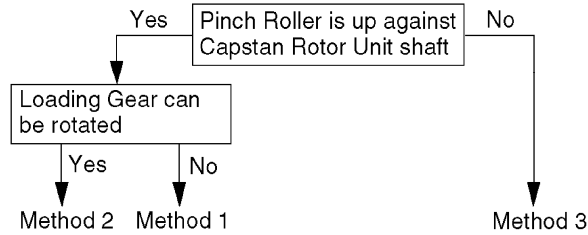
**Wiper Arm Unit may be damaged or its spring may be out of place when the jammed tape is removed by force.**

Remove a jammed tape as follows:

##### 5.1.10.1. Manual Method

When a tape jam is encountered, check the tape loading condition and use the following procedure to remove a tape jam.

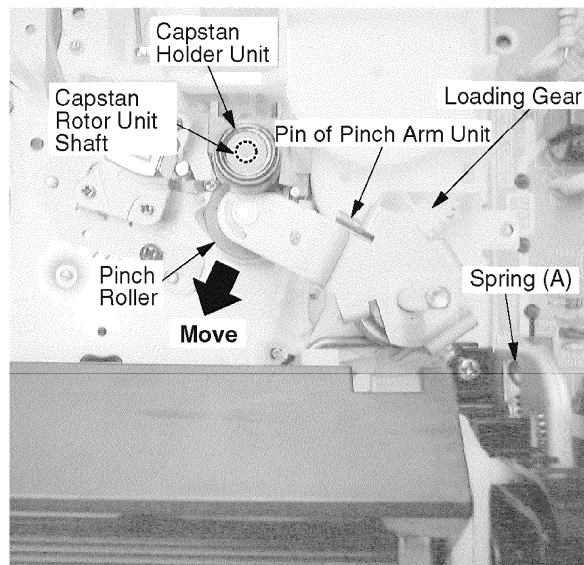
**Fig. 8-1**



**Method -1:**

- 1. Move the Pinch Roller Unit out by unhooking the Pin of Pinch Arm Unit so that the Pinch Roller is separated from the Capstan Rotor Unit shaft.**

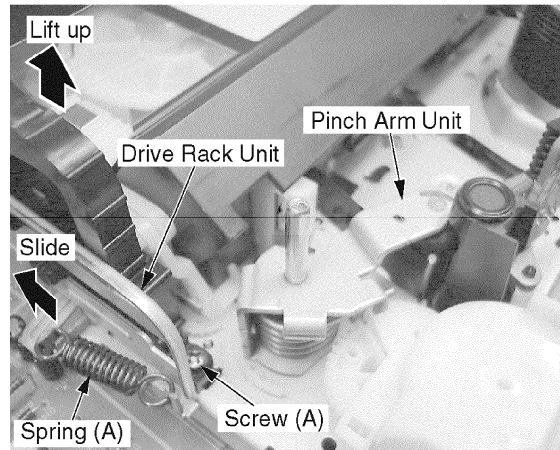
**Fig. 8-2**



Top View

- 2. Remove the tape from the tape path.**
- 3. Rewind the tape into the cassette by rotating the Center Clutch Unit counterclockwise.**
- 4. Unhook Spring (A) of the Drive Rack Arm.**
- 5. Remove Screw (A).**
- 6. Lift the Cassette Up Ass'y. While pulling the Cassette Up Ass'y out far enough so that it clears the Drive Rack Arm, slide the Drive Rack Unit as indicated by the arrow to remove the cassette tape from the Cassette Up Ass'y.**
- 7. Check the cause of mechanical trouble and repair.**

**Fig. 8-3**



Method -2:

1. Rotate Loading Motor counterclockwise with needlenose pliers, etc. so that the Pinch Roller is separated from the shaft of the Capstan Rotor Unit.
2. Perform Step 2 through Step 7 of Method -1.

Method -3:

1. Perform Step 2 through Step 7 of Method -1.

Note:

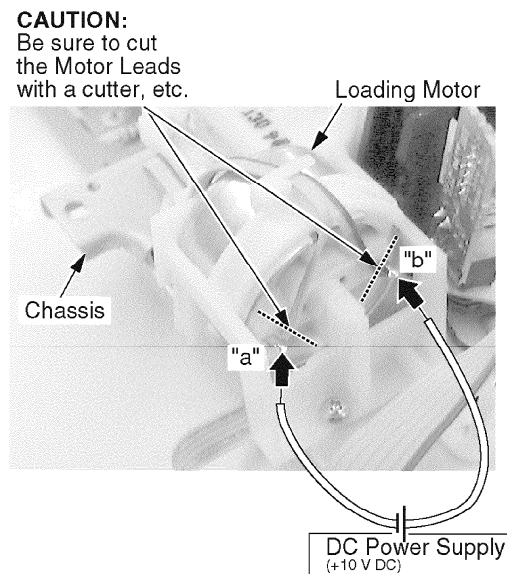
**After repairing mechanical trouble, make sure that all gear alignments are correct, especially the Wiper Arm Unit and Drive Rack Unit of Cassette Up Ass'y. (Refer to "EJECT Position Confirmation" in DISASSEMBLY/ASSEMBLY PROCEDURES.)**

#### 5.1.10.2. Electrical Method

Electrical method can only be performed when the mechanism is moved by rotating the Loading Gear.  
CAUTION:

1. Before applying DC Power Supply, be sure to cut the Motor Leads with a cutter, etc.  
Otherwise, the Loading Motor Drive IC (IC2501) may be damaged.  
When reconnecting the Motor Leads, solder at below / 320 °C for less than 3 seconds.
  2. If loading does not start in approx. 2 seconds after DC Power Supply is applied, DO NOT continue to apply DC Power Supply. Instead, perform "Manual Method."
1. Be sure to cut the Motor Leads with a cutter, etc.
  2. Apply +10.0 V DC Power Supply to the Loading Motor terminals.
  3. When the Loading Posts reach the fully unloaded position, remove the Power Supply.

**Fig. 9**



**4. Rewind the tape into the cassette by turning the Center Clutch Unit counterclockwise.**

**5. Eject the cassette by applying +10.0 V DC Power Supply again.**

#### **5.1.11. BLACK SCREWS ON THE CHASSIS**

Black Screws are used on the Mechanism Chassis to identify screws that require adjustment.

#### **5.1.12. HOW TO RESET ALL VCR MEMORY FUNCTIONS**

To reset (clear) the select language, channel auto set and set clock functions to their initial power on condition (power on, no cassette inserted), hold down the PLAY and CH UP buttons on the unit together for more than 5 seconds.

Power will shut off.

#### **5.1.13. HOW TO CONFIRM AUTO CLOCK SET FEATURE**

- 1. Connect an RF cable from the output of one unit to the input of the test unit.**
- 2. Select corresponding RF channels.**
- 3. Playback a recording of P.B.S. channel including clock set data and confirm this feature.**

#### **5.1.14. VARIABLE VOLTAGE ISOLATION TRANSFORMER**

An Isolation Transformer should always be used during the servicing of VCR whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect VCR from being damaged by accidental shorting that may occur during servicing.

Also, when troubleshooting the above type of Power Supply Circuit, a variable isolation transformer is required in order to increase the input voltage slowly.

#### **5.1.15. SPECIAL NOTE**

All integrated circuits and many other semiconductor devices are electrostatically sensitive and

therefore require the special handling techniques described under the "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" section of this service manual.

#### **5.1.16. REPLACEMENT PROCEDURE FOR LEADLESS (CHIP) COMPONENTS**

The following procedures are recommended for the replacement of the leadless components used in this unit.

### **1. Preparation for replacement**

#### **A. Soldering Iron**

Use a pencil-type soldering iron that uses less than 30 watts.

#### **B. Solder**

Eutectic Solder (Tin 63 %, Lead 37 %) is recommended.

#### **C. Soldering time**

Do not apply heat for more than 4 seconds.

#### **D. Preheating**

Leadless capacitor must be preheated before installation. - (266 °F ~ 302 °F)

(130 °C ~150 °C) for about 2 minutes.

**Note:**

**A. Leadless components must not be reused after removal.**

**B. Excessive mechanical stress and rubbing of the component electrode must be avoided.**

### **2. Removing the leadless component**

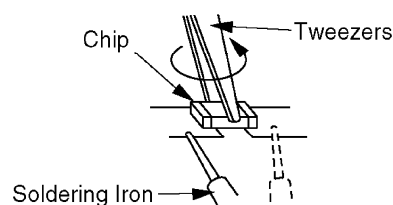
Grasp the leadless component body with tweezers and alternately apply heat to both electrodes. When the solder on both electrodes is melted, remove the leadless component with a twisting motion.

**Note:**

**A. Do not attempt to lift the component off the board until the component is completely disconnected from the board by a twisting action.**

**B. Be careful not to break the copper foil on the printed circuit board.**

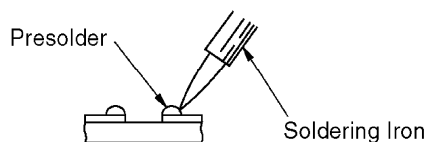
**Fig. 10-1**



### **3. Installing the leadless component**

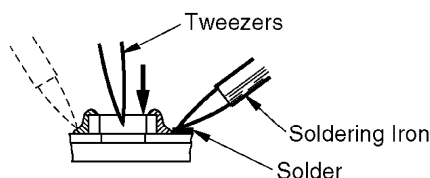
**A. Presolder the contact points on the circuit board.**

**Fig. 10-2**



**B. Press the part downward with tweezers and solder both electrodes as shown below.**

**Fig. 10-3**



**Note:**

**Do not glue the replacement leadless component to the circuit board.**

#### **5.1.17. MODEL NO. IDENTIFICATION MARK**

Use Marks shown in the chart below to distinguish the different models included in this Service Manual.

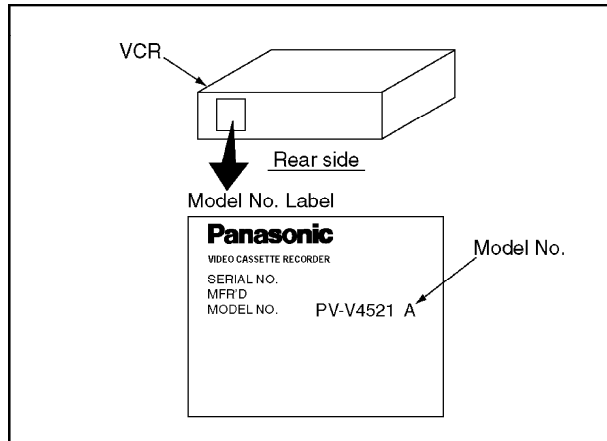
MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N
Not Used	Z

**Note:**

Refer to Item 3 of Schematic Diagram Notes of Schematic Diagram and Circuit Board Layout Notes, for mark "Z."

#### **5.1.18. MODEL NUMBER INDICATION**

The Model number is indicated on the Model No. Label which is located on the rear side of the Cabinet.

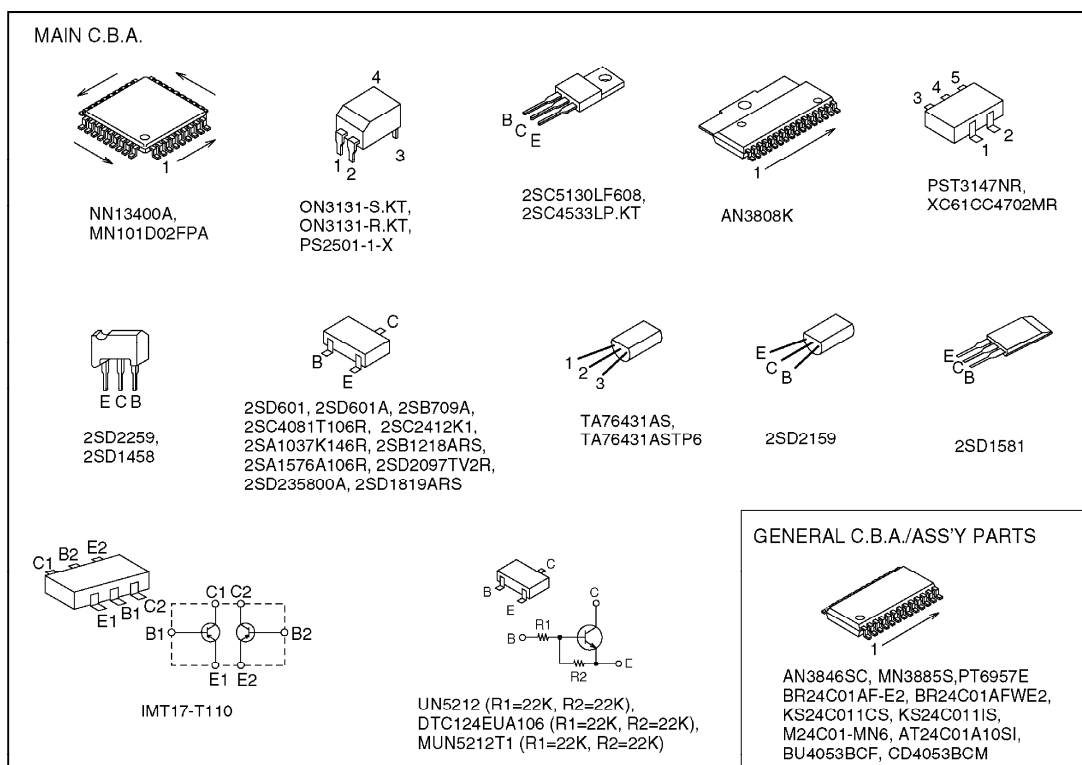


Differences between PV-V4521 and PV-V4521A are as below.

- Cylinder Unit (Ref. No. 11)
- Grounding Plate Unit (Ref. No. 57)
- Screw (Ref. No. 430)
- Flexible Flat Cable (Ref. No. 718)
- Main C.B.A. (Ref. No. E10)

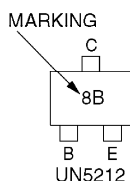
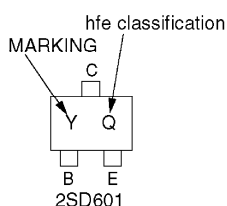
When ordering these, be sure to confirm the model number printed on the Model No. Label and order the proper parts according to the replacement parts list.

## 5.2. IC, TRANSISTOR AND CHIP PART INFORMATION

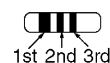


## HOW TO READ THE IDENTIFICATION MARK OF CHIP COMPONENTS.

MARKING	PART NO.	MARKING	PART NO.
B	2SB709A	F	2SA1576A106R
B	2SC4081T106R	Y	2SD601
B	2SB1218ARS	Z	2SD1819ARS
B	2SC2412K1	Z	2SD601A
F	2SA1037K146R	8B	UN5212



## HOW TO READ THE VALUES OF THE CYLINDRICAL TYPE CHIP COMPONENTS.



The widest color band must be read first for value.

### 1. RESISTOR

There are two types (ERD10LLJ... and ERD10TLJ...) of chip parts.

1) ERD10LLJ: Refer to above type.

2) ERD10TLJ : The narrow color band must be read first for value.

If this part is included in the parts list, be sure that the color band is read properly when servicing.

### 2. CAPACITOR

Because of the width of the color bands, the reading direction cannot be specified. However, the color band can be read on either side. Be sure to confirm the value using the schematic diagram.

### CAUTION :

Once chip parts are removed, they must not be reused. Always use a new part when installing a chip part.

# 6. DISASSEMBLY/ASSEMBLY PROCEDURES

## 6.1. CABINET SECTION

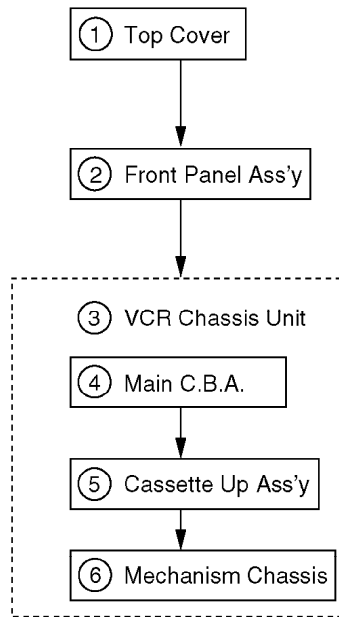
### 6.1.1. Disassembly Flowchart

Perform all disassembly procedures in the order described in the "Disassembly Flowchart" shown below. When reassembling, use the reverse procedure.

CAUTION:

**Disconnect AC plug before disassembly.**

Fig. D1



### 6.1.2. Disassembly Method

STEP /LOC. No.	PART	Fig. No.	REMOVE	Note
①	Top Cover	D2	2(S-1)	1
②	Front Panel Ass'y	D2	3(L-1), 3(L-2)	2
③	VCR Chassis Unit	D2	(S-2), 3(S-3), (S-4), 2(S-5), (L-3), Grounding Plates	3
④	Main C.B.A.	D2	(S-6), P3501, P4001, P4002, P6201, P6202, Shield Plate	4
⑤	Cassette Up Ass'y	D2	(S-7), 2(S-8), (L-4), (P-1)	5
⑥	Mechanism Chassis	D2	-----	---
↑ A	↑ B	↑ C	↑ D	↑ E

How to read chart shown above:

**A:**Order of Procedure steps.

When reassembling, perform steps(s) in reverse order.

These numbers are also used as the identification (location) No. of parts in Figures.

**B:** Part to be removed or installed.

**C:** Fig. No. showing Procedure or Part Location.

**D:** Identification of part to be removed, unhooked, unlocked, released, unplugged or unsoldered.

2(S-1) = 2 Screws (S-1), 2(L-1) = 2 Locking Tabs (L-1),

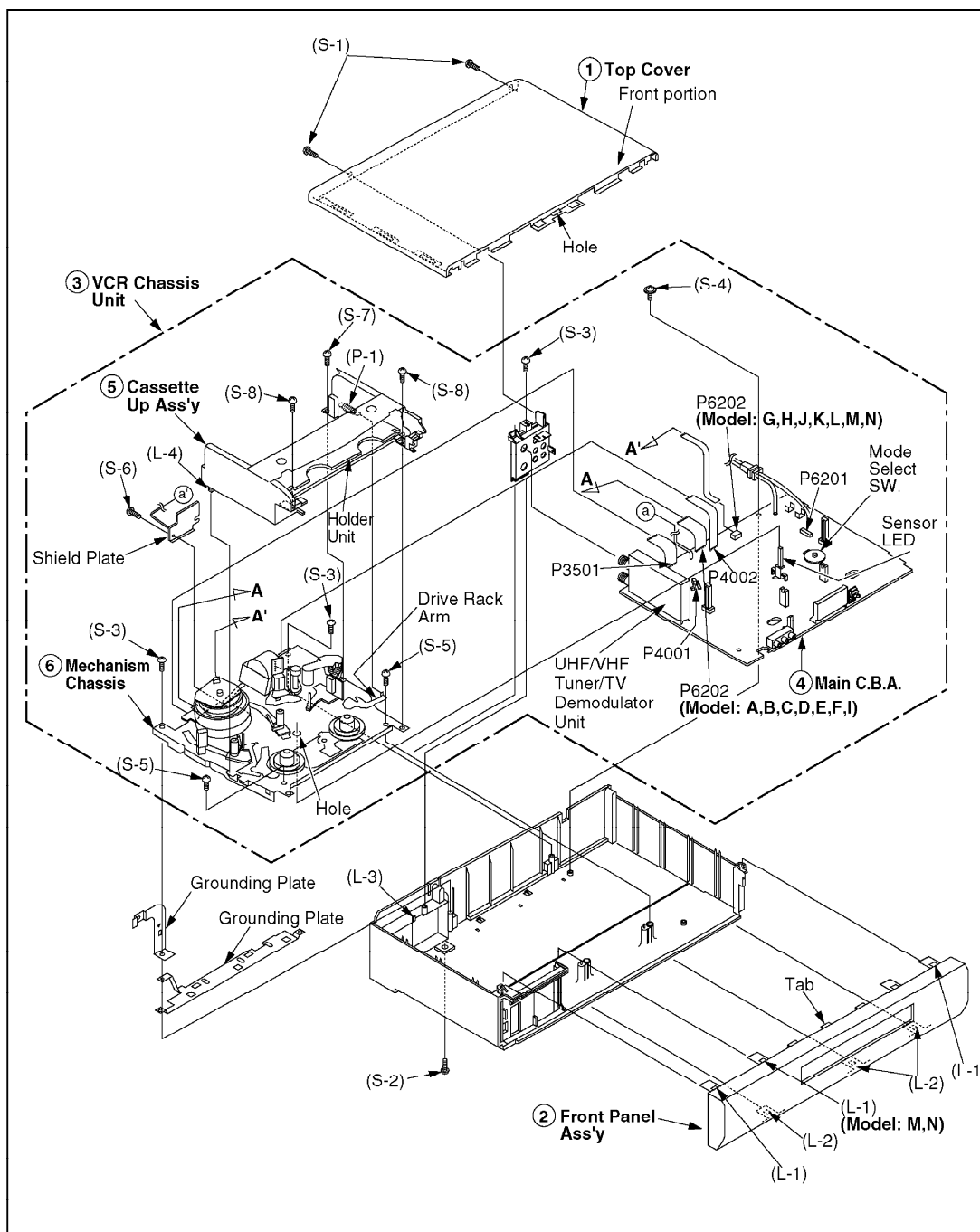
(P-1) = Spring (P-1)

**E:** Refer to "Notes in chart."

### COMPARISON CHART OF MODELS & MARKS

MODEL	MARK	MODEL	MARK
PVQ-V201	A	PV-V4521	H
PV-V4021	B	PV-V4521A	I
PV-V4021-K	C	PV-V4521-K	J
-----	D	-----	K
VHQ-401	E	VHQ-451	L
VHQ-41M	F	PV-V4611	M
PV-V4511	G	-----	N

Fig. D2



#### 6.1.2.1. Notes in chart

### 1. Installation of Top Cover

Install the Top Cover front portion at a downward angle so that the tab on the Front Panel Ass'y fits into the hole in the Top Cover.

Then, lower the rear portion into place and tighten 2 Screws (S-1).

### 2. Installation of Front Panel Ass'y

#### CAUTION:

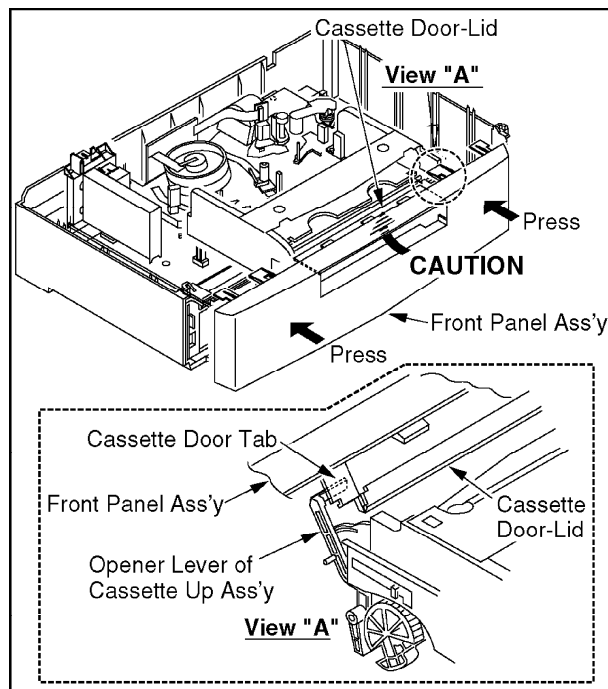
Opener Lever may be damaged when Front Panel Ass'y is installed, with Cassette Door-Lid of Front Panel Ass'y and Opener Lever of Cassette Up Ass'y set incorrectly.

A. When installing the Front Panel Ass'y, swing the Cassette Door-Lid all the way open until the Cassette Door tab clears the Opener Lever.

B. Make sure that all locking tabs are aligned properly.

Then, press the Front Panel straight in.

Fig. D3



### 3. Installation of VCR Chassis Unit

When installing 2 Screws (S-5), slide the Holder Unit of the Cassette Up Ass'y (Refer to "METHOD FOR LOADING/UNLOADING OF MECHANISM" in Service Notes) to tighten screws. Then, slide it back to the EJECT Position.

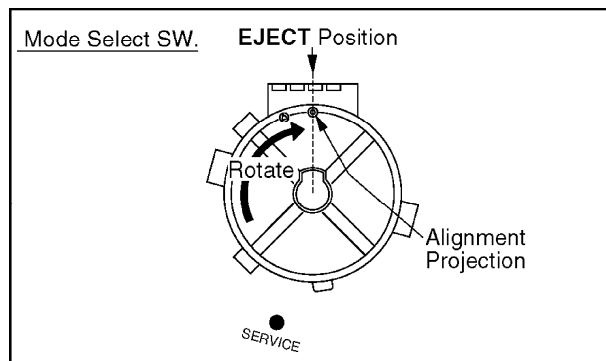
Make sure that Mechanism and Cassette Up Ass'y are in the EJECT Position. (Refer to "EJECT Position Confirmation" in DISASSEMBLY/ ASSEMBLY PROCEDURES.)

### 4. Installation of Mechanism Chassis and Cassette Up Ass'y onto Main

**C.B.A.**

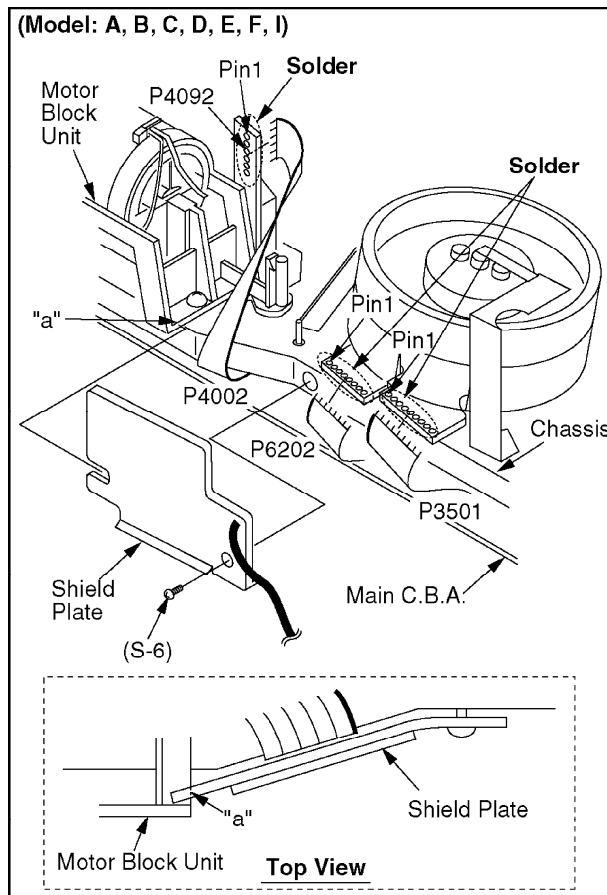
- A. Make sure the Mode Select SW. on the Main C.B.A. is in EJECT position. If not, rotate the Mode Select SW. until the alignment projection is in the EJECT Position.**
- B. Make sure the Mechanism and Cassette Up Ass'y are in the EJECT Position. (Refer to "EJECT Position Confirmation" in DISASSEMBLY/ ASSEMBLY PROCEDURES.)**

**Fig. D4**

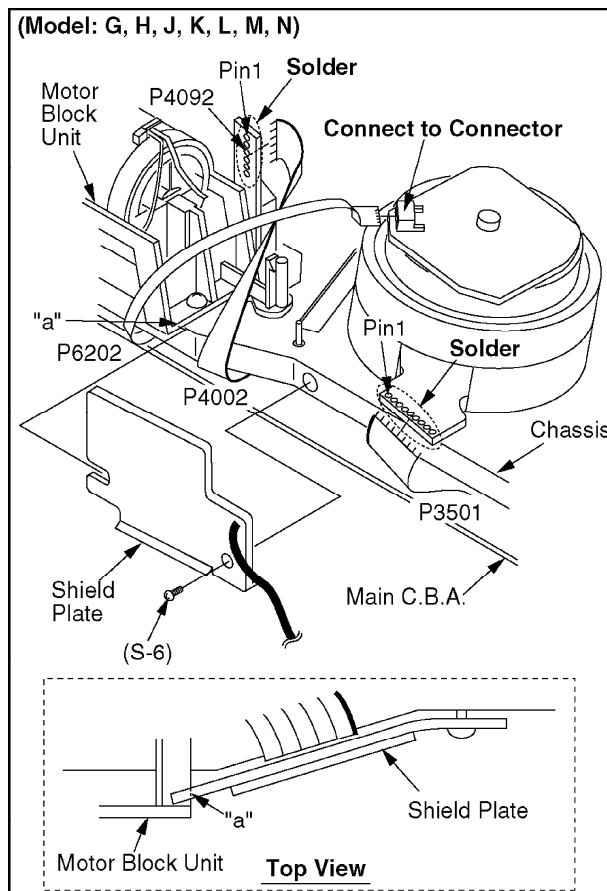


- C. Install the Mechanism Chassis and Cassette Up Ass'y straight onto the Main C.B.A. so that the Sensor LED clears the hole in the Mechanism Chassis and that 2 Connectors (P4001, P6201) are aligned and seated securely.**
  - D. Connect the Flat Flexible Cables from P3501, P4002 and P6202 on the Main C.B.A. by soldering at below 320°C for less than 3 seconds as shown.**
- Install the Shield Plate as shown.**

**Fig. D5-1**



**Fig. D5-2**



**COMPARISON CHART OF MODELS & MARKS**

MODEL	MARK	MODEL	MARK
PVQ-V201	A	PV-V4521	H
PV-V4021	B	PV-V4521A	I
PV-V4021-K	C	PV-V4521-K	J
-----	D	-----	K
VHQ-401	E	VHQ-451	L
VHQ-41M	F	PV-V4611	M
PV-V4511	G	-----	N

## **5. Installation of Cassette Up Ass'y**

- A. Confirm that the Locking Tab (L-4) under the Cassette Up Ass'y is in Hole on the Mechanism Chassis when installing the Cassette Up Ass'y. Then, slide the Cassette Up Ass'y towards the back.**
- B. When installing 2 Screws (S-8), slide the Holder Unit (Refer to "METHOD FOR LOADING/UNLOADING OF MECHANISM" in Service Notes) to tighten screws. Then, slide it back to the EJECT Position.**
- C. Hook Spring (P-1) to the Drive Rack Arm on the Mechanism Chassis.**

## **6.2. MECHANISM SECTION**

### **6.2.1. Disassembly/Reassembly Method**

This procedure starts with the condition that the cabinet parts and Main C.B.A. have been removed.  
When reassembling, perform the step(s) in the reverse order.

**Perform all disassembly/reassembly and alignments procedures in EJECT Position.**

Step/loc. No.	Prior Step(s)	Part	Fig. No.	Remove	Alignment/Adjustment
①	-----	Grounding Plate Unit (Model: A,B,C,D,E,F,I)	J2-1	(S-1)	Adjustment
②	-----	Full Erase Head	J2-1	(L-1)	
③	1	Cylinder Unit	J2-1	3(S-3)	TAPE INTERCHANGEABILITY Adjustment
④	-----	Capstan Belt	J3-1	-	
⑤	-----	Support Angle	J3-1	(S-4), (S-5)	
⑥	5	Intermediate Gear B	J3-1	(L-2)	Gear Alignment
⑦	4,5,6	Main Cam Gear	J3-1	Main Cam Push Nut	Gear Alignment
⑧	4	Center Clutch Unit	J4-1	(W-1)	
⑨	4,8	Changing Gear Spring	J4-1	-	
⑩	4,8,9	Changing Gear	J4-1	-	
⑪	4,8,9,10	Idler Arm Unit	J4-1	-	
⑫	-----	Reel Gear	J5-1	2(L-3)	
⑬	4,5,6,7,8,9,10	Main Rod	J5-1	(W-2), (L-4)	Gear Alignment
⑭	-----	Stopper Angle	J6-1	(S-6)	
⑮	4,5,14	Capstan Rotor Unit	J6-1	-	
⑯	4,5,14,15	Oil Seal	J6-1	-	
⑰	4,5,14,15	Capstan Stator C.B.A.	J6-1	P2503, 2(S-7)	
⑱	-----	MR Head	J6-1	(S-8), Unsolder	MR HEAD GAP Adjustment
⑲	4,8,9,10,13	T Loading Arm Unit	J7-1	-	Gear Alignment
⑳	4,5,6,7,8,9,10,13,19	S Loading Arm Unit	J7-1	-	Gear Alignment
㉑	-----	T Brake Unit	J8-1	-	
㉒	-----	Tension Control Arm Unit	J8-1	3(L-5)	
㉓	21	T Reel Table	J8-1	-	
㉔	22	S Reel Table	J8-1	-	
㉕	22	Tension Arm Unit	J8-1	2(L-6), (P-1), (P-2)	
㉖	22,25	Loading Post Base-T Unit	J9	-	P2 AND P3 POST HEIGHT,
㉗	22,25	Loading Post Base-S Unit	J9	-	TAPE INTERCHANGEABILITY Adjustment
㉘	-----	Opener Piece	J10-1	2(L-7)	
㉙	4,5,6,7	Drive Rack Arm	J10-1	-	
㉚	28	Pinch Arm Unit	J10-1	-	
㉛	28,30	P5 Arm Unit	J10-1	-	
㉜	5,6,28	Intermediate Gear A	J10-1	-	Gear Alignment
㉝	-----	Motor Block Unit	J11-1	2(S-9)	
㉞	-----	Audio Control Head Unit	J11	(S-10)	TAPE INTERCHANGEABILITY Adjustment
㉟	5,6,28,30,32,33	Lift Gear	J11	-	
㊱	4,5,14,15,33	Capstan Holder Unit	J11	3(S-11)	
㊲	22,25	Tension Arm Boss	J11	(L-8)	
㊳	-----	Cleaner Arm Unit (Model: D)	J11	(L-9)	

**How to read chart shown above:**

A: Order of Procedure steps.

When reassembling, perform steps(s) in reverse order.

These numbers are also used as the identification (location) No. of parts in Figures.

B: Steps to be completed prior to the current step.

C: Part to be removed or installed.

D: Fig. No. showing Procedure or Part Location.

E: Identification of part to be removed, unhooked, unlocked, released, unplugged or unsoldered.

(S-1) = Screw (S-1), (L-1) = Locking Tab (L-1),

(W-1) = Washer (W-1), (P-1) = Spring (P-1),

(C-1) = Cut Washer (C-1)

F: Alignment/Adjustment which is required when installing or replacing each Parts.

## COMPARISON CHART OF MODELS & MARKS

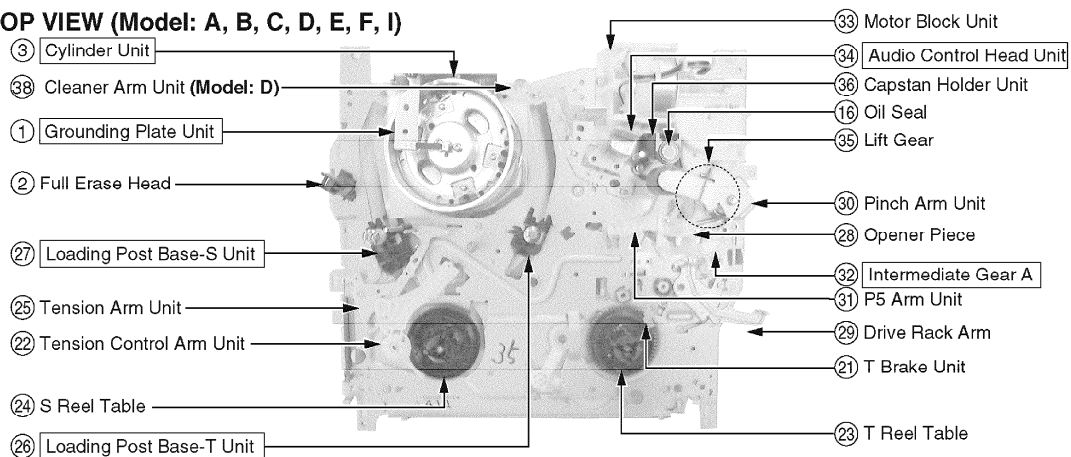
MODEL	MARK	MODEL	MARK
PVQ-V201	A	PV-V4521	H
PV-V4021	B	PV-V4521A	I
PV-V4021-K	C	PV-V4521-K	J
-----	D	-----	K
VHQ-401	E	VHQ-451	L
VHQ-41M	F	PV-V4611	M
PV-V4511	G	-----	N

### 6.2.2. Inner Parts Location

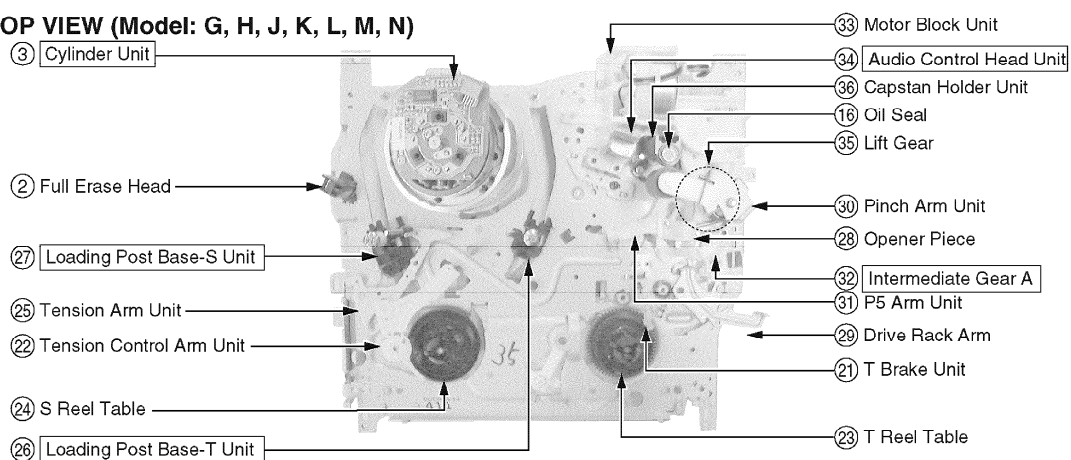
**Note:** BOX indicates alignment (Gear Alignment or Mechanical Adjustment) required when a part is replaced.

**Fig. J1-1**

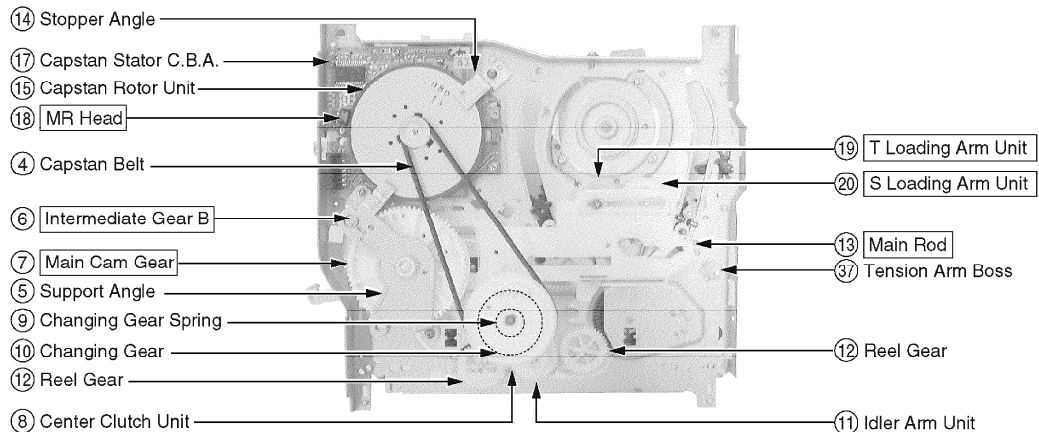
### TOP VIEW (Model: A, B, C, D, E, F, I)



### TOP VIEW (Model: G, H, J, K, L, M, N)



### BOTTOM VIEW



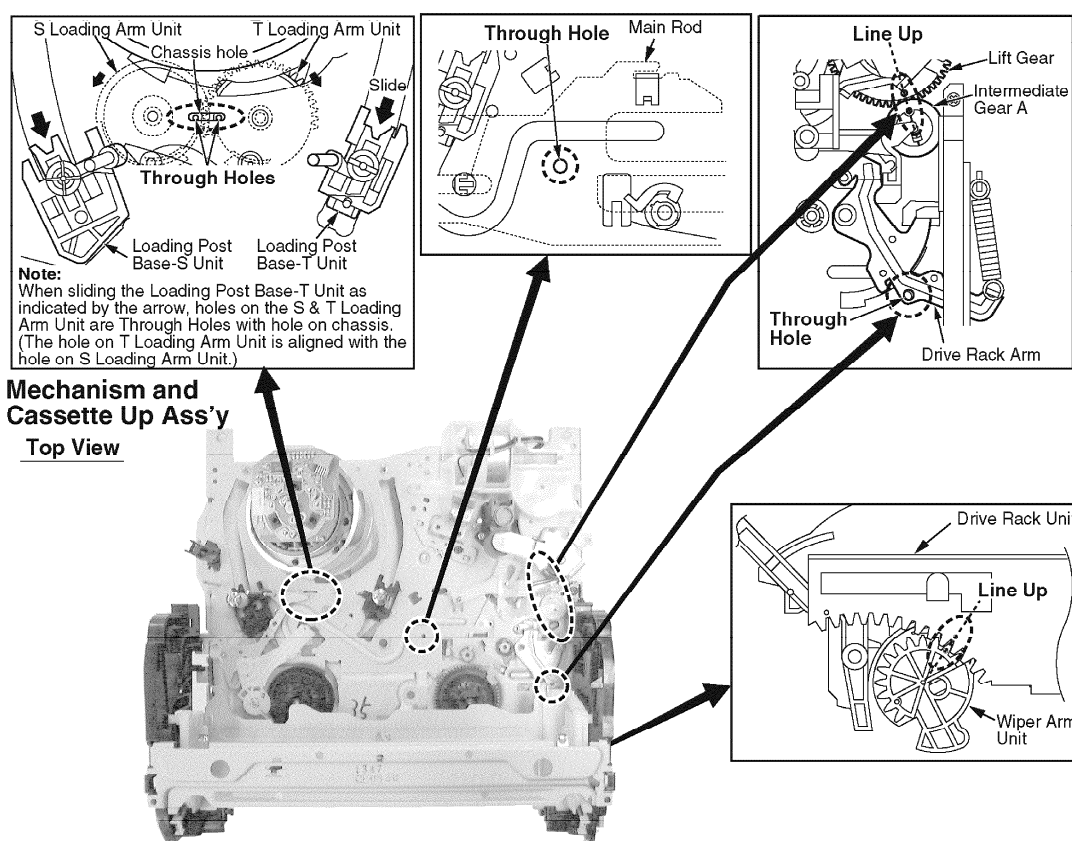
## COMPARISON CHART OF MODELS & MARKS

MODEL	MARK	MODEL	MARK
PVQ-V201	A	PV-V4521	H
PV-V4021	B	PV-V4521A	I
PV-V4021-K	C	PV-V4521-K	J
-----	D	-----	K
VHQ-401	E	VHQ-451	L
VHQ-41M	F	PV-V4611	M
PV-V4511	G	-----	N

### 6.2.3. EJECT Position Confirmation

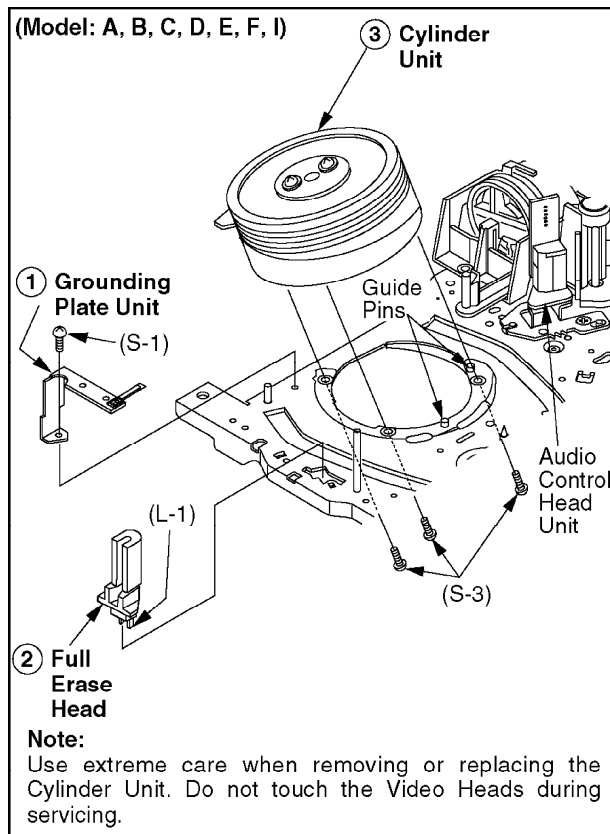
Fig. J1-2

Check the following alignment points to confirm that the Mechanism and Cassette Up Ass'y are in the **EJECT** Position from the top side.

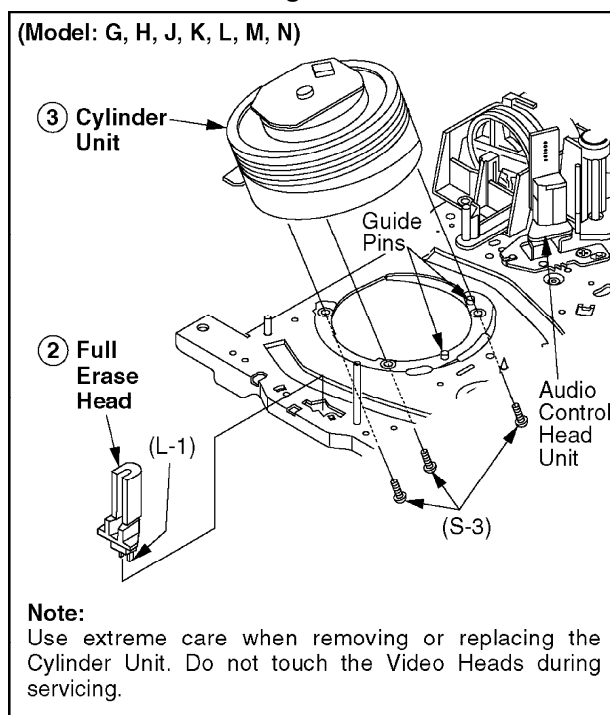


### 6.2.4. Grounding Plate Unit, Full Erase Head, and Cylinder Unit

Fig. J2-1-1



**Fig. J2-1-2**



#### COMPARISON CHART OF MODELS & MARKS

MODEL	MARK	MODEL	MARK
PVQ-V201	A	PV-V4521	H
PV-V4021	B	PV-V4521A	I
PV-V4021-K	C	PV-V4521-K	J
-----	D	-----	K
VHQ-401	E	VHQ-451	L
VHQ-41M	F	PV-V4611	M
PV-V4511	G	-----	N

#### 6.2.4.1. Reassembly Notes

##### 1. (Model: A, B, C, D, E, F, I)

##### Adjustment of Grounding Plate Unit

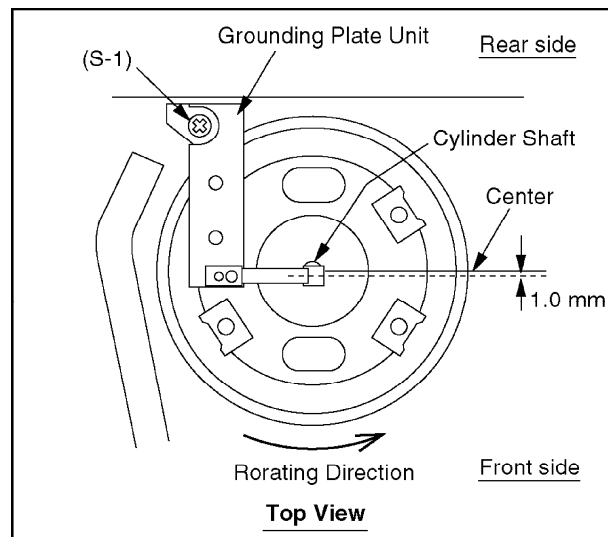
**A.** After installing, make sure that the Grounding Plate Unit, on the top side of mechanism chassis, is positioned on the front side of the Cylinder shaft so that the center line of the plate is just less than 1.0 mm measured from the center of the Cylinder shaft.

If required, adjust the plate position by loosening Screw (S-1).

Never install the Grounding Plate Unit on the rear side of the Cylinder shaft.

Incorrect positioning will cause cylinder buzz.

Fig. J2-2



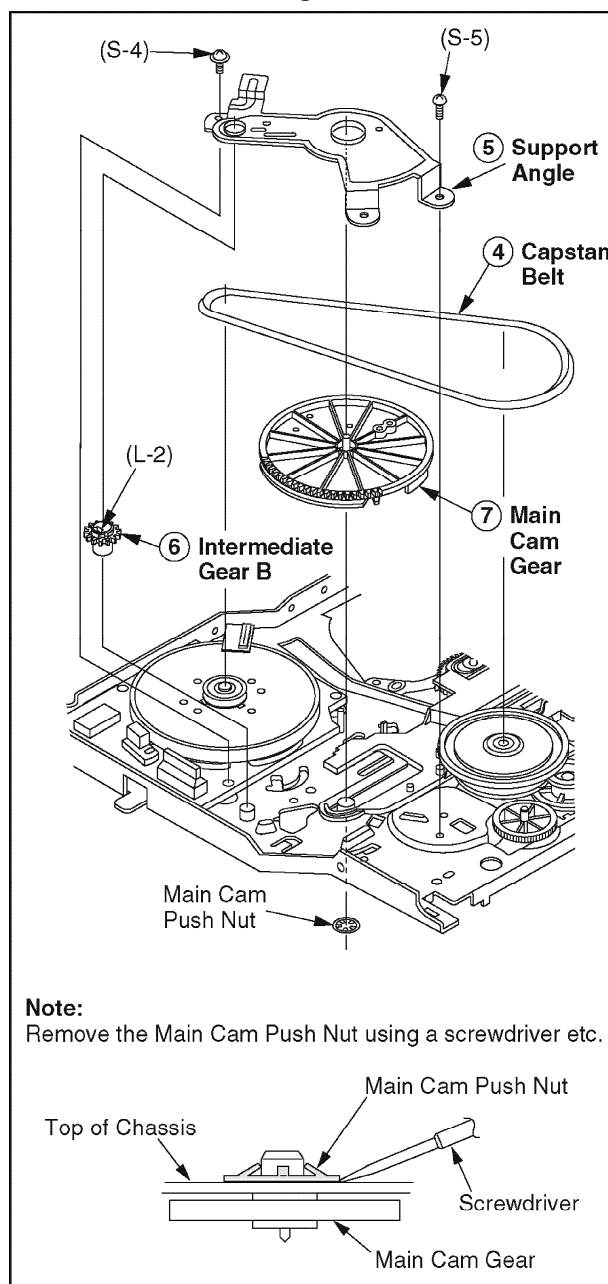
**2.** After replacing the Cylinder Unit, clear the Total elapsed "Cylinder rotation" time (in hours) to 0. Refer to "USAGE SCREEN MODE" in SERVICE NOTES.

## COMPARISON CHART OF MODELS & MARKS

MODEL	MARK	MODEL	MARK
PVQ-V201	A	PV-V4521	H
PV-V4021	B	PV-V4521A	I
PV-V4021-K	C	PV-V4521-K	J
-----	D	-----	K
VHQ-401	E	VHQ-451	L
VHQ-41M	F	PV-V4611	M
PV-V4511	G	-----	N

### 6.2.5. Capstan Belt, Support Angle, Intermediate Gear B, and Main Cam Gear

Fig. J3-1

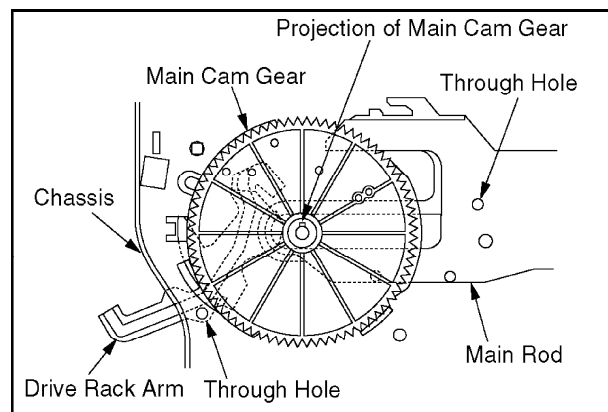


#### 6.2.5.1. Reassembly Notes

### 1. Alignment of Main Cam Gear, Drive Rack Arm, and Main Rod

- A. Confirm that the hole on Main Rod is a Through Hole with a hole on chassis.**
- B. Confirm that the hole on Drive Rack Arm is a Through Hole with a hole on chassis.**
- C. Install the Main Cam Gear so that the projection of Main Cam Gear is in the upward position as shown.**

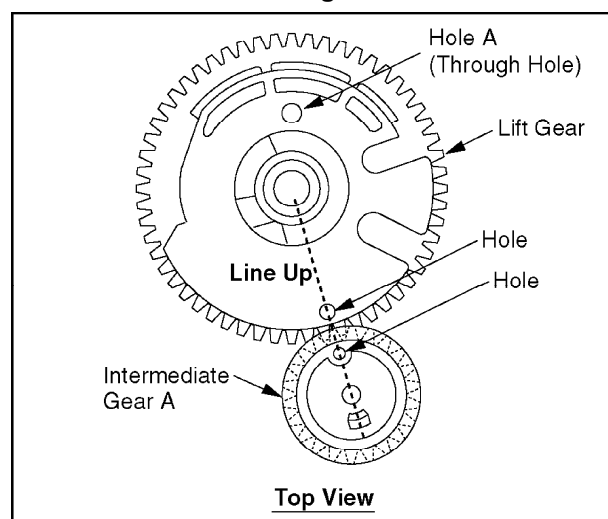
**Fig. J3-2**



## **2. Confirmation/Alignment of Intermediate Gear B, Main Cam Gear, and Intermediate Gear A**

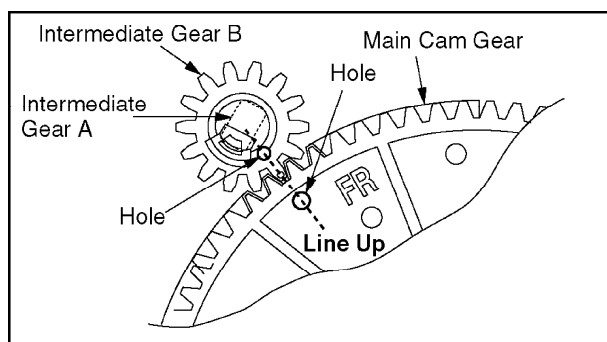
- A. Confirm that the Hole A on Lift Gear is a Through Hole with a hole on chassis.**
- B. Confirm that the hole on Intermediate Gear A is aligned with the hole on Lift Gear.**

**Fig. J3-3**



- C. Install the Intermediate Gear B so that the hole on the Intermediate Gear B is aligned with the hole on the Main Cam Gear.**

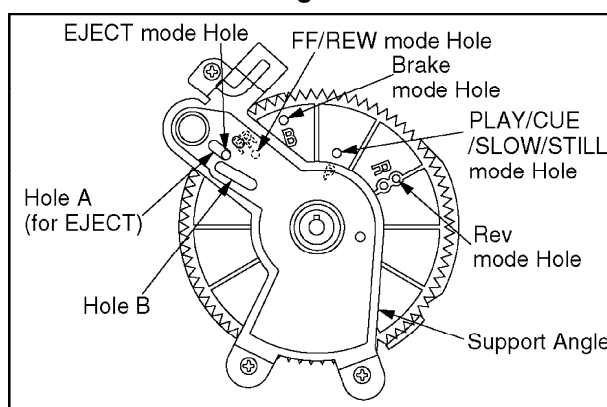
**Fig. J3-4**



### 3. Holes on Main Cam Gear

- A. The EJECT mode Hole on Main Cam Gear should be a Through Hole with Hole A on Support Angle in EJECT mode. The each mode Hole on Main Cam Gear should be a Through Hole with Hole B on Support Angle in each mode.**

**Fig. J3-5**



### 4. Main Cam Gear Kit

- A. Main Cam Gear is supplied as a Main Cam Gear Kit only (Kit No. VVGS0009).**

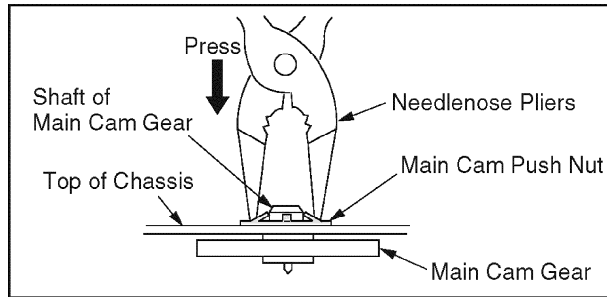
**Main Cam Gear Kit consists of a Main Cam Gear and a Main Cam Push Nut.**

**However, Main Cam Push Nut is available separately as a replacement part.**

### 5. Installation of Main Cam Gear and Main Cam Push Nut

- A. After installing the Support Angle, install the Main Cam Push Nut with Needlenose Pliers etc. so that it is flush with the chassis. There may be some slight scratches on the Shaft of Main Cam Gear, when removing the Main Cam Gear. In case that the Main Cam Gear can be installed securely without tottering, it is fine to use the one. If any tottering, install all new parts.**

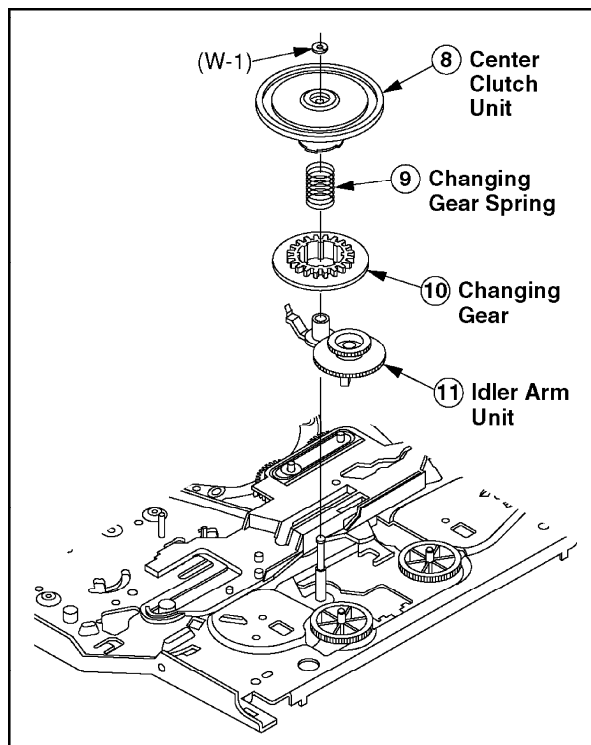
**Fig. J3-6**



**6. The Main Cam Push Nut is not reusable. Install a new one.**

#### 6.2.6. Center Clutch Unit, Changing Gear Spring, Changing Gear, and Idler Arm Unit

**Fig. J4-1**

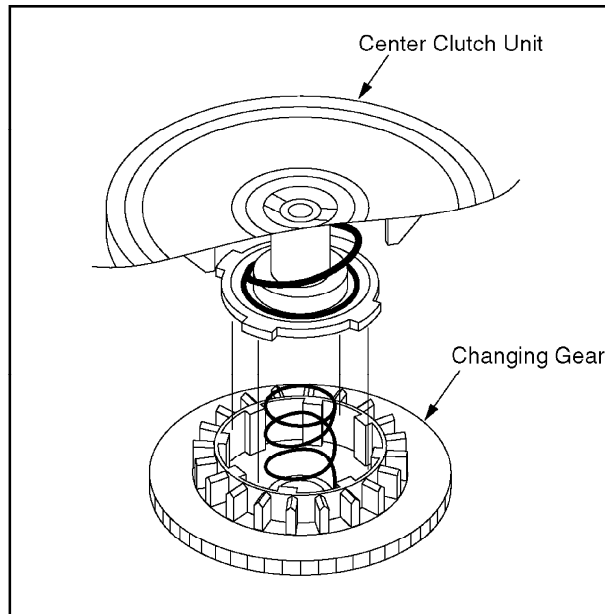


##### 6.2.6.1. Reassembly Notes

#### 1. Installation of Center Clutch Unit

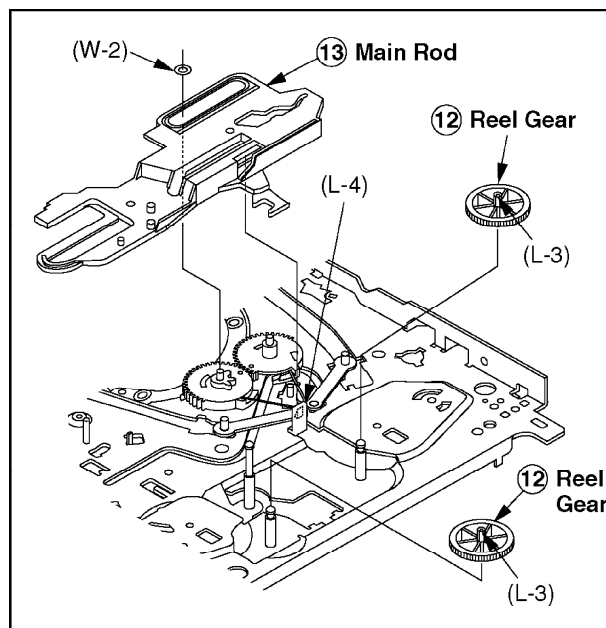
**A. Fit the Center Clutch Unit into the Changing Gear.**

**Fig. J4-2**



### 6.2.7. Reel Gear and Main Rod

Fig. J5-1



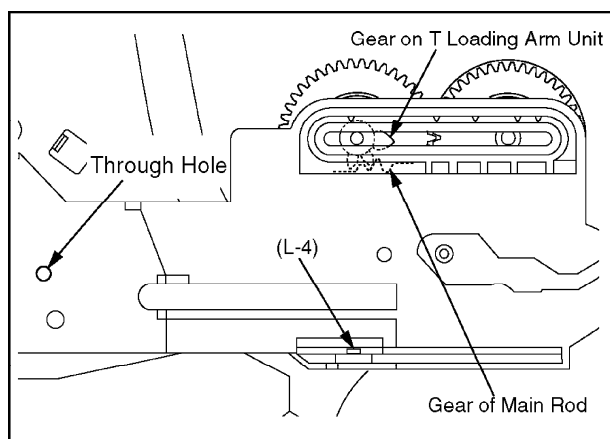
#### 6.2.7.1. Reassembly Notes

##### 1. Alignment of Main Rod and T Loading Arm Unit

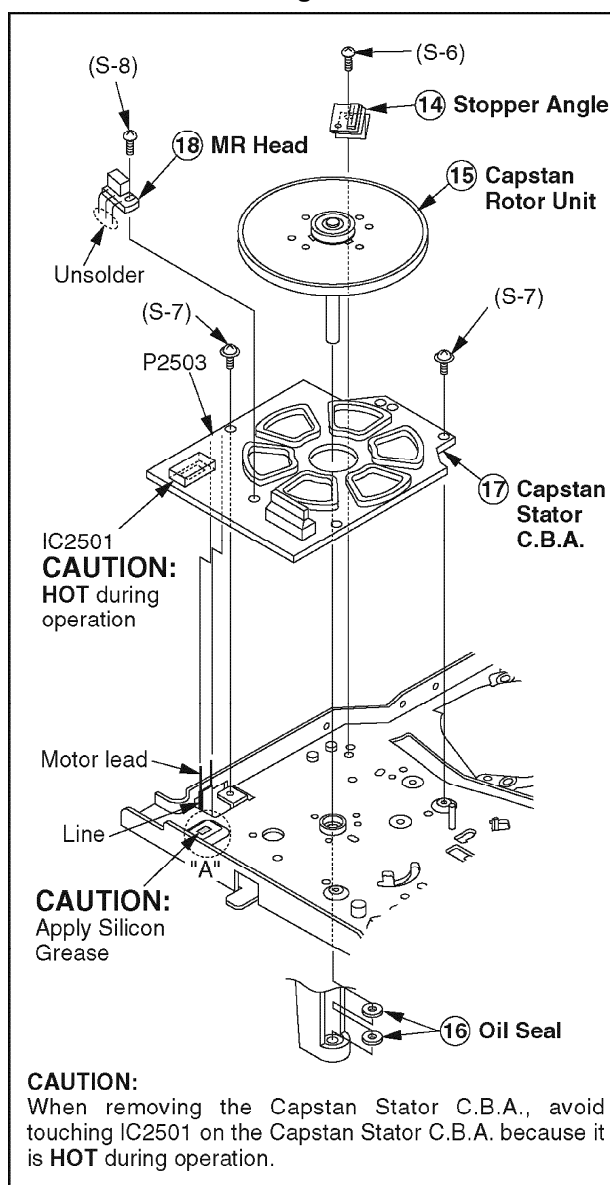
##### A. Align the Gear on T Loading Arm Unit with Gear of Main Rod.

Confirm that the Hole on Main Rod is a Through Hole with a hole on chassis.

Fig. J5-2



### 6.2.8. Stopper Angle, Capstan Rotor Unit, Oil Seal, Capstan Stator C.B.A., and MR Head



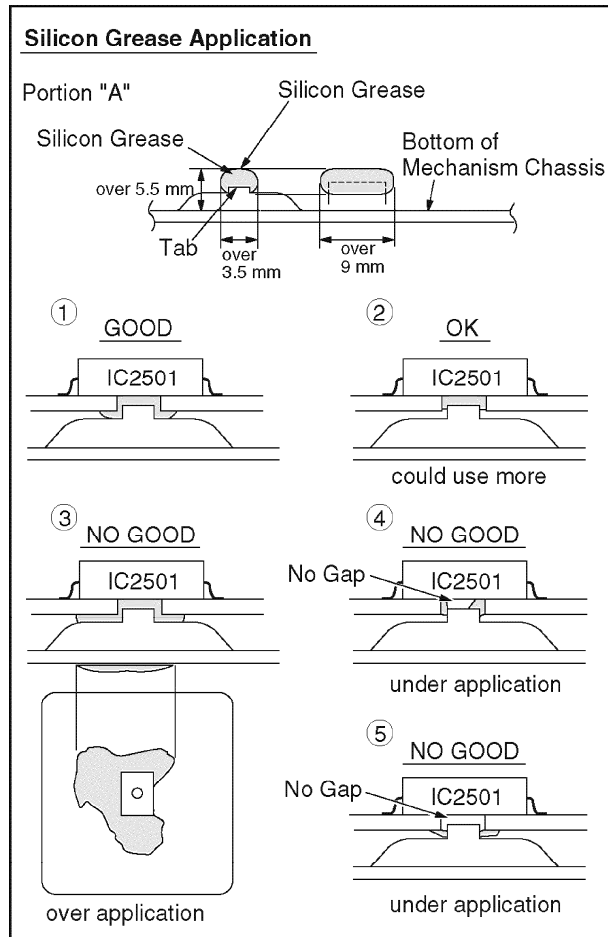
### 6.2.8.1. Reassembly Notes

## 1. Application of Silicon Grease

### CAUTION:

When installing the IC2501 (AN3846SC) or Capstan Stator C.B.A., be sure to apply Silicon Grease (VFK1301) as shown. Be careful not to touch other parts with greased portion to prevent grease depletion.

Fig. J6-2

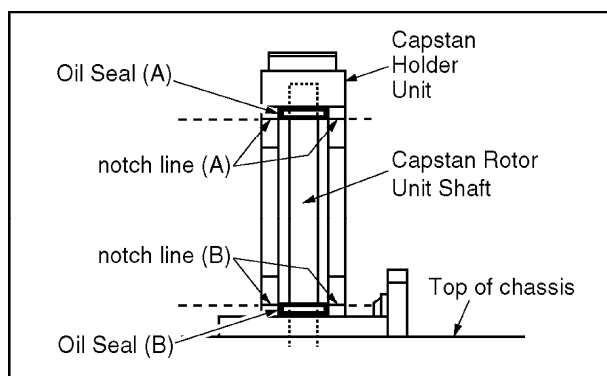


## 2. Installation of Capstan Rotor Unit and Oil Seal

A. Install the 2 Oil Seals into the Capstan Holder Unit. Then, insert the Capstan Rotor Unit Shaft into the hole of the Capstan Holder Unit so that shaft passes through 2 Oil Seals. Be careful not to scratch the Shaft or Capstan Holder Unit.

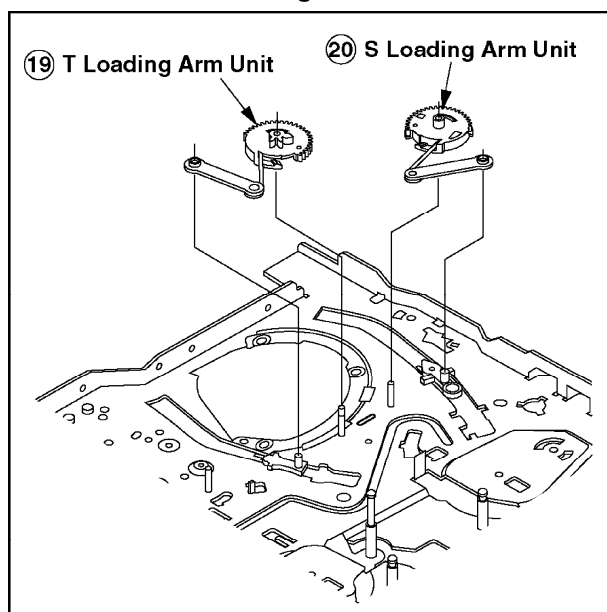
B. Align the bottom of Oil Seal (A) with notch line (A).  
Align the top of Oil Seal (B) with notch line (B).

Fig. J6-3



## 6.2.9. T Loading Arm Unit and S Loading Arm Unit

Fig. J7-1

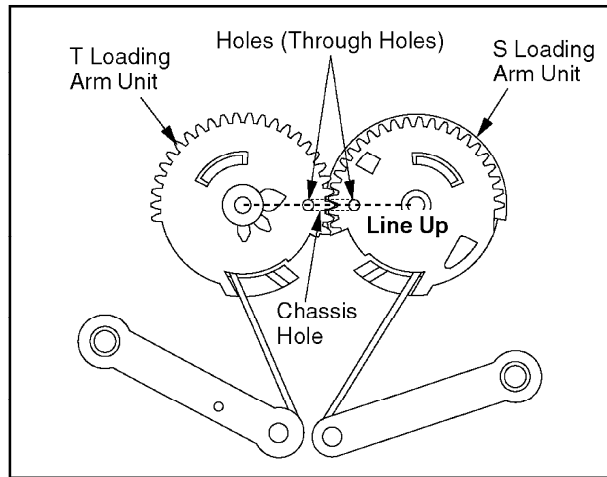


### 6.2.9.1. Reassembly Notes

#### 1. Alignment of T Loading Arm Unit and S Loading Arm Unit

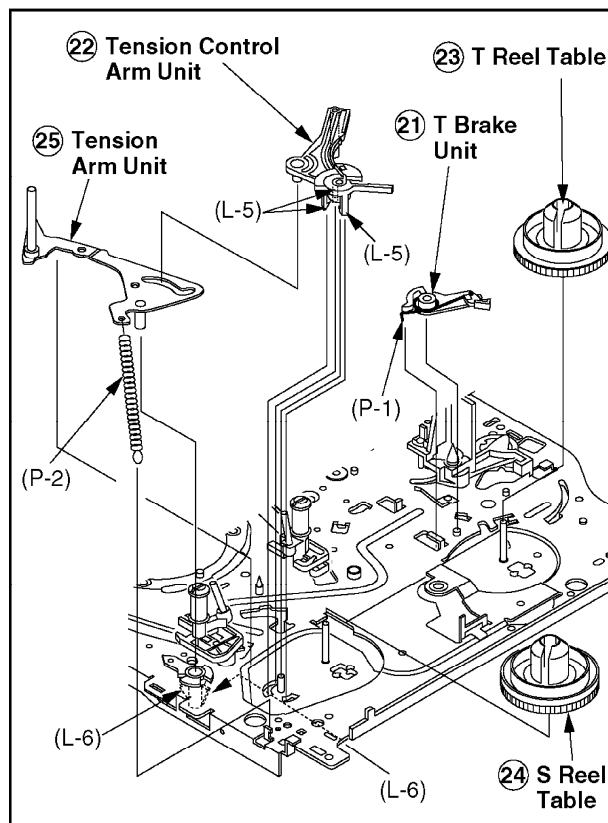
- A. Install the S Loading Arm Unit onto the chassis.
- B. Install the T Loading Arm Unit so that the hole on T Loading Arm Unit is aligned with the hole on S Loading Arm Unit.
- C. Confirm that the holes on the S & T Loading Arm Unit are Through Holes with hole on chassis.

Fig. J7-2



## 6.2.10. T Brake Unit, Tension Control Arm Unit, T Reel Table, S Reel Table, and Tension Arm Unit

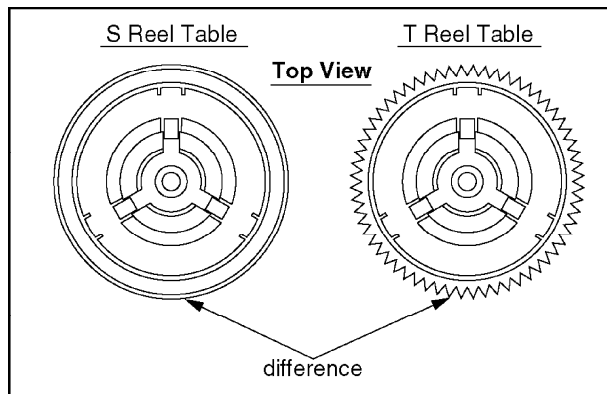
Fig. J8-1



### 6.2.10.1. Reassembly Notes

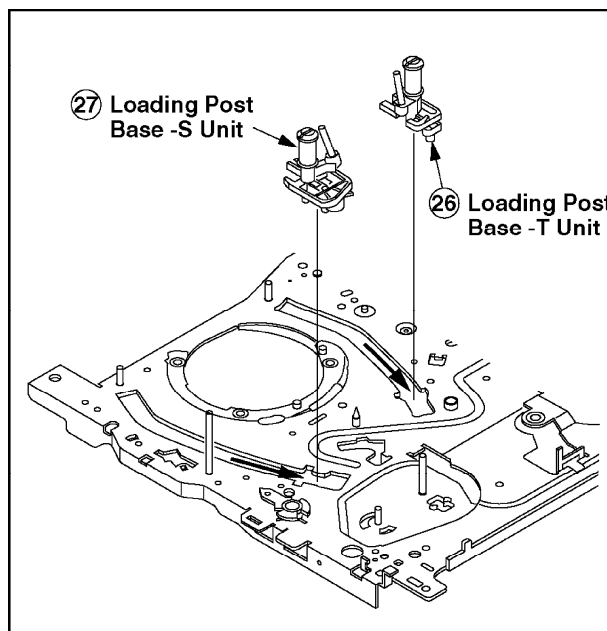
#### 1. How to distinguish between S Reel Table and T Reel Table

Fig. J8-2



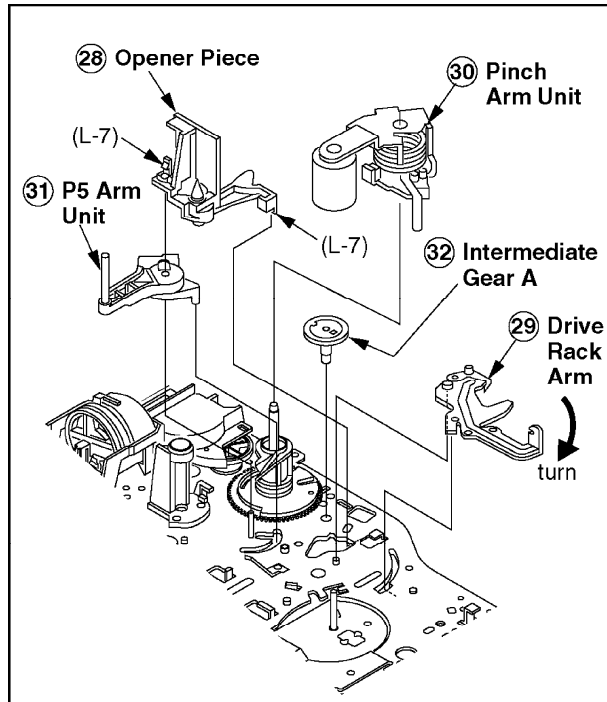
#### 6.2.11. Loading Post Base -T Unit and Loading Post Base -S Unit

Fig. J9



#### 6.2.12. Opener Piece, Drive Rack Arm, Pinch Arm Unit, P5 Arm Unit, and Intermediate Gear A

Fig. J10-1

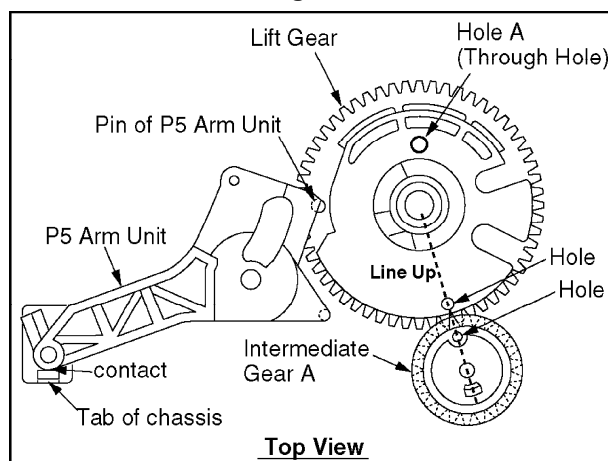


#### 6.2.12.1. Reassembly Notes

### 1. Installation/Alignment of Intermediate Gear A, Lift Gear and P5 Arm Unit

- A. Rotate the Lift Gear so that Hole A on Lift Gear is a Through Hole with a hole on chassis.
- B. Install the Intermediate Gear A so that the hole on Intermediate Gear A is aligned with the hole on Lift Gear.
- C. Install the P5 Arm Unit so that it contacts with the tab of chassis.

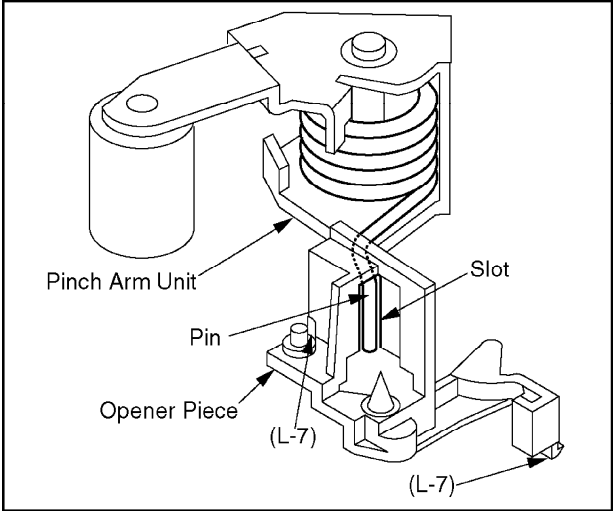
Fig. J10-2



### 2. Installation of Opener Piece

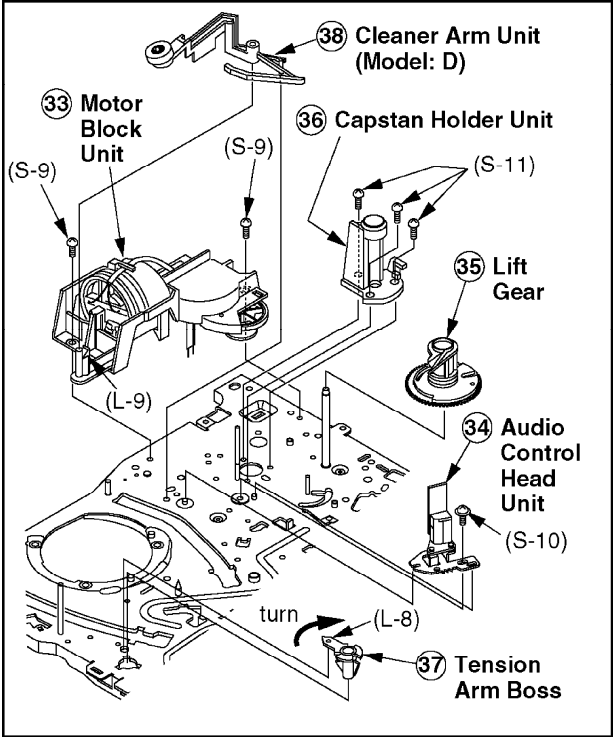
- A. Install the Opener Piece so that the slot of the Opener Piece is inserted to the Pin of Pinch Arm Unit

Fig. J10-3



### 6.2.13. Motor Block Unit, Audio Control Head Unit, Lift Gear, Capstan Holder Unit, Tension Arm Boss, and Cleaner Arm Unit

Fig. J11



COMPARISON CHART OF MODELS & MARKS

MODEL	MARK	MODEL	MARK
PVQ-V201	A	PV-V4521	H
PV-V4021	B	PV-V4521A	I
PV-V4021-K	C	PV-V4521-K	J
-----	D	-----	K
VHQ-401	E	VHQ-451	L
VHQ-41M	F	PV-V4611	M
PV-V4511	G	-----	N

### 6.3. CASSETTE UP ASS'Y SECTION

This chart indicates Step/Location No. of Parts to be serviced and prior steps to gain access items to be serviced when disassembling. When reassembling, perform the step(s) in the reverse order.

Step/Loc. No.	Prior Step(s)	Part	Fig. No.	Remove	Alignment/Adjustment
①	-----	Top Plate	K1-1	(L-1), (L-2)	
②	1	Wiper Arm Unit	K1-1	2(L-3)	Gear Alignment
③	1,2	Holder Unit	K1-1	-	
④	-----	Opener Lever	K2	2(L-4)	
⑤	1,2,3,4	Drive Rack Unit	K2	-	

↑  
A

↑  
B

↑  
C

↑  
D

↑  
E

↑  
F

How to read chart shown above:

**A: Order of Procedure steps.**

When reassembling, perform steps(s) in reverse order.

These numbers are also used as the identification (location) No. of parts in Figures.

**B: Steps to be completed prior to the current step.**

**C: Part to be removed or installed.**

**D: Fig. No. showing Procedure or Part Location.**

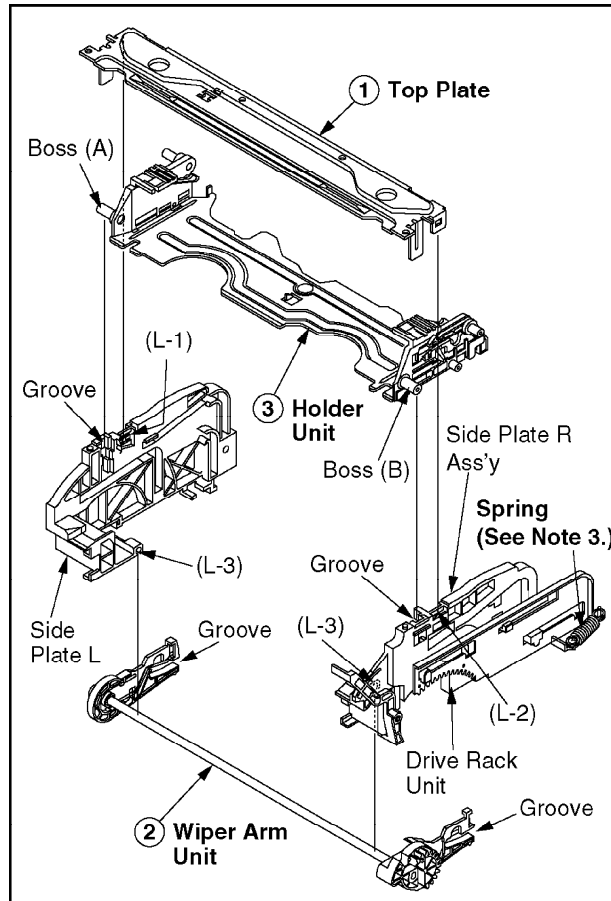
**E: Identification of part to be removed, unhooked, unlocked, released, unplugged or unsoldered.**

(S-1) = Screw (S-1), (L-1) = Locking Tab (L-1), (W-1) = Washer (W-1), (P-1) = Spring (P-1), (C-1) = Cut Washer (C-1)

**F: Alignment/Adjustment which is required when installing or replacing each Parts.**

### 6.3.1. Top Plate, Wiper Arm Unit, and Holder Unit

Fig. K1-1

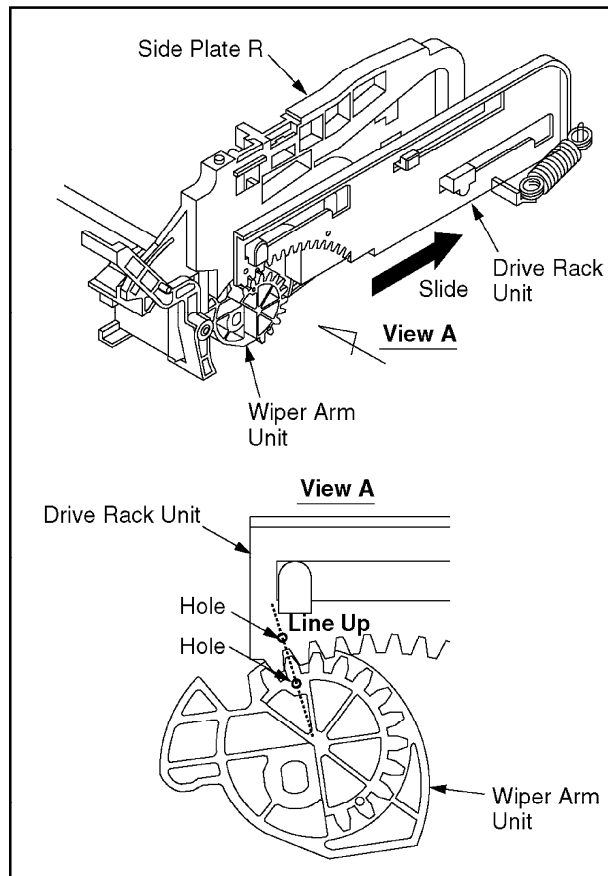


#### 6.3.1.1. Reassembly Notes

##### 1. Alignment of Wiper Arm Unit and Drive Rack Unit

- A. Slide the Drive Rack Unit to the far right as indicated by the arrow.
- B. Install the Wiper Arm Unit so that the hole on the Wiper Arm Unit is aligned with the hole on the Drive Rack Unit.

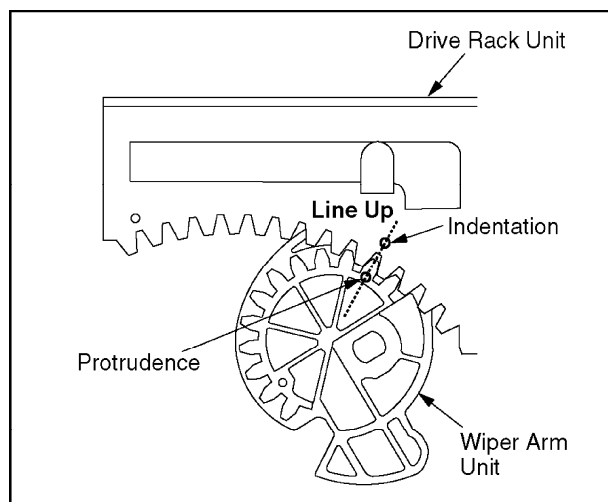
Fig. K1-2



## 2. Installation of Holder Unit

- A. Turn the Wiper Arm Unit so that the grooves on each end are aligned with the each groove on Side Plate L and R.
- B. Insert Holder Unit boss (A) and (B) into the grooves as shown in Fig. K1-1.
- C. Finally, in the EJECT Position, confirm that the protrudence on the Wiper Arm Unit is aligned with the indentation on the Drive Rack Unit.

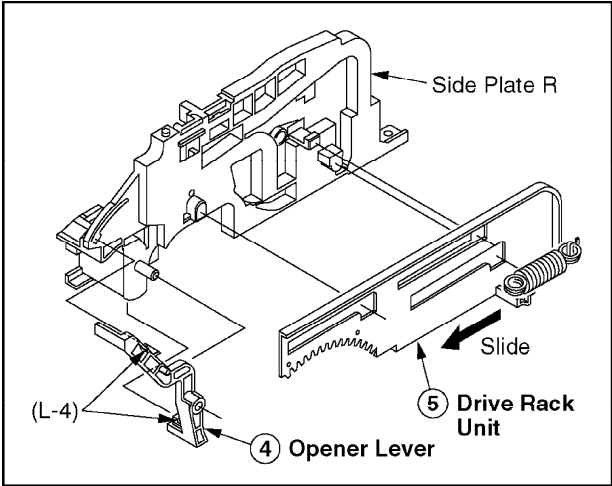
Fig. K1-3



3. Make sure to hook the spring to the Drive Rack Arm of Mechanism chassis.

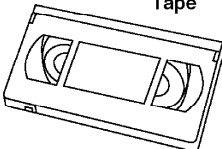
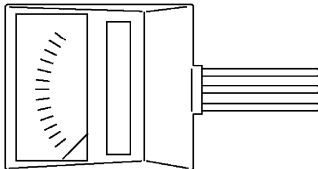
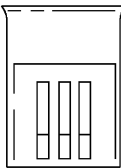
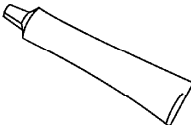

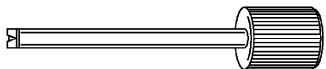

6.3.2. Opener Lever and Drive Rack Unit

Fig. K2



# 7. ADJUSTMENT PROCEDURES

## 7.1. SERVICE FIXTURES AND TOOLS

<p>VFMS0003H6</p> <p>VHS Alignment Tape</p>  <table border="1"><tr><td>Video</td><td>Color Bar &amp; Monoscope</td></tr><tr><td>Audio</td><td>6kHz(MONO)</td></tr></table>	Video	Color Bar & Monoscope	Audio	6kHz(MONO)	<p>Back Tension Meter (Made in USA., Purchase Locally)</p> 	<p>VFK27</p> <p>Head Cleaning Stick</p> 
Video	Color Bar & Monoscope					
Audio	6kHz(MONO)					
<p>VFK1301</p> <p>Silicon Grease</p> 	<p>VFKS0081</p> <p>Grease</p> 	<p>VFK0329</p> <p>Post Adjustment Driver</p> 				
<p>VFK0330</p> <p>H-Position Adjustment Driver</p> 						

## 7.2. MECHANICAL ADJUSTMENT

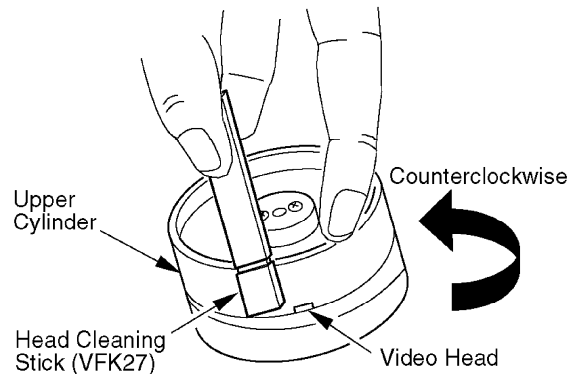
### 7.2.1. CLEANING PROCEDURE FOR THE UPPER CYLINDER UNIT

1. While slowly turning the Upper Cylinder Unit counterclockwise by hand, gently rub the Video Heads with a Head Cleaning Stick (VFK27)

moistened with Ethanol.

When using a Cleaning Cassette, make sure to use "DRY" type only and be aware that excessive use can shorten head life.

Fig. M1



Note:

1. Do not rub vertically or apply excess pressure to the Video Heads. Do not turn the Upper Cylinder Unit clockwise while cleaning.
2. After cleaning, use a Dry Head Cleaning Stick (VFK27) to remove any Ethanol remaining on the cylinder tape path. Otherwise, tape damage will occur.

## 7.2.2. ADJUSTMENT PROCEDURES

### 7.2.2.1. BACK TENSION CONFIRMATION

#### Purpose:

To fine adjust the Back Tension so that the tape runs smoothly with a constant tension.

#### Symptom of Misadjustment:

- 1) If the tape tension is less than the specified value, the tape cannot come into proper contact with the Video Heads, resulting in poor picture playback.
- 2) If the tape tension is too high, the tape will soon be damaged.

#### Equipment Required:

Back Tension Meter (Made in U.S.A., Purchase Locally)  
VHS Cassette Tape (120-Minute Tape)

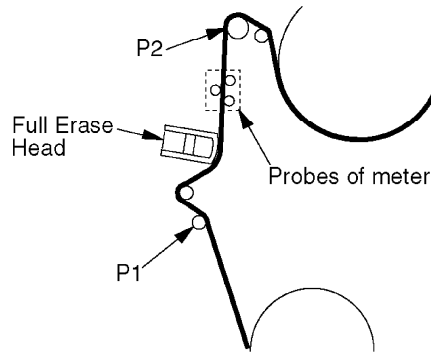
#### Specification:

20 gf $\pm$ 2.5 gf  
(0.196 N $\pm$ 0.025 N)

1. Play back a T120 cassette tape from the beginning for approx. 10 to 20 seconds to stabilize tape movement.

**2. Insert a Tension Meter into tape path and measure the back tension.**

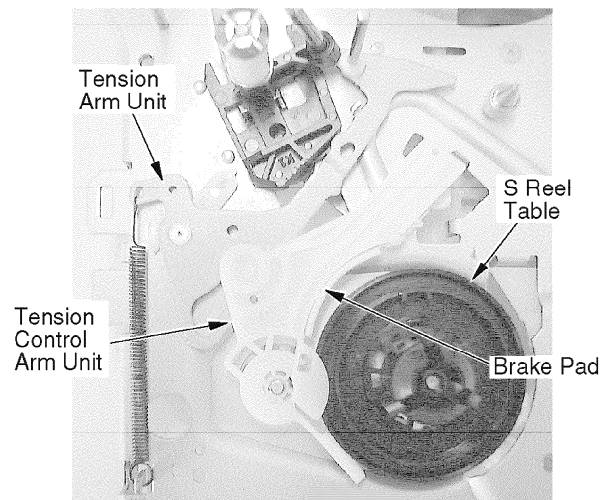
**Fig. M2-1**



**3. If the reading is out of specification, make sure that there is no dust or foreign material between the Brake Pad of Tension Control Arm Unit and the S Reel Table.**

**After cleaning, the reading of tension measurement is still out of specification, replace the Tension Arm Unit and the Tension Control Arm Unit.**

**Fig. M2-2**



**Note:**

- 1. Be sure that the three probes of the meter are all in solid contact with the tape, but not touching any other parts of the mechanism.**
- 2. It is recommended that measurements should be repeated at least three (3) times because the tension meter is very sensitive to external vibrations.**

**7.2.2.2. MR HEAD GAP ADJUSTMENT**

**Purpose:**

**To properly pick up the FG Signal.**

**Symptom of Misadjustment:**

If the FG Signal is not properly picked up, Servo Operation cannot be achieved.

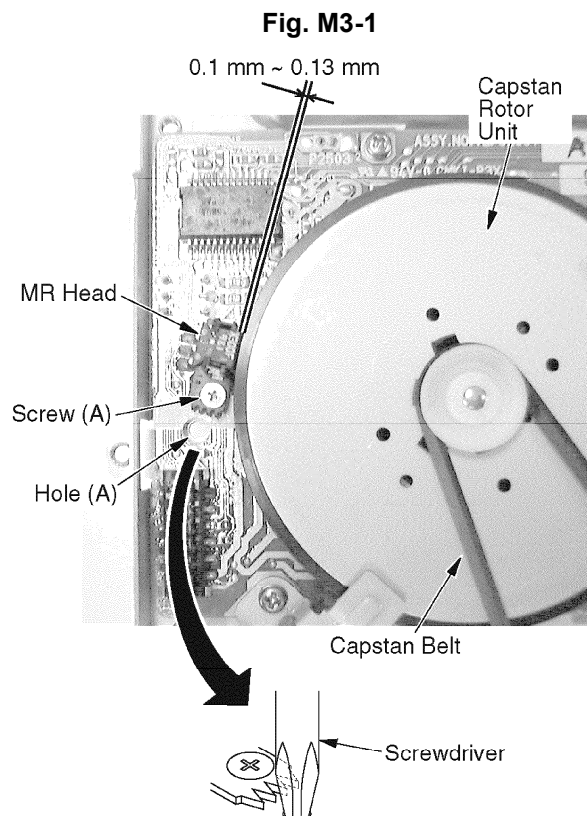
**Equipment Required:**

Oscilloscope

**Specification:**

0.1 mm ~ 0.13 mm

1. Remove the VCR Chassis Unit and then place it upside down.
2. Remove the Main C.B.A.
3. Slightly loosen Screw (A). Then set the Screwdriver (Phillips Driver) into the Hole (A). Turn the screwdriver clockwise until the MR Head touches the rotor. Then turn it slightly counterclockwise to make the clearance as specified.
4. Tighten Screw (A).
5. Reinstall the Main C.B.A.

**Note:**

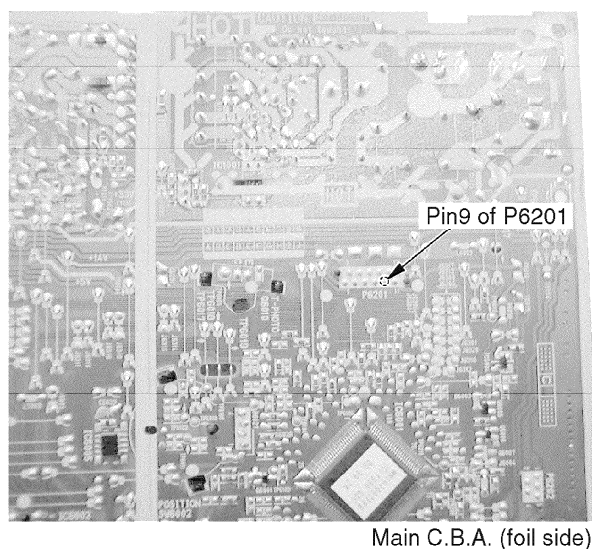
Do not touch the outside circumference of the rotor surface with any tool and keep magnetic material away from the rotor magnet (especially

metal particles).

#### Confirmation of Signal Level

1. Place the unit in Service Position (2-1), (2-2). Refer to "SERVICE POSITION" in SERVICE NOTES.
2. Supply a Video Signal to the video input jack.
3. Insert a cassette tape and place the unit in SLP recording mode.
4. Connect the oscilloscope to Pin 9 of P6201 on the Main C.B.A. Confirm that the signal level is greater than 20 mV [P-P].

Fig. M3-2



Main C.B.A. (foil side)

#### 7.2.2.3. TAPE INTERCHANGEABILITY ADJUSTMENT

##### Note:

To perform these adjustment/confirmation procedures, enter the Tracking center mode.

##### Equipment Required:

Dual Trace Oscilloscope

VHS Alignment Tape (VFMS0003H6)

Post Adjustment Driver (VFK0329)

H-Position Adjustment Driver (VFK0330)

##### 7.2.2.3.1. ENVELOPE OUTPUT ADJUSTMENT

The height of the P2 and P3 Posts replacement part is preadjust at the factory.

##### Purpose:

To achieve a satisfactory picture and secure precise tracking.

##### Symptom of Misadjustment:

If the envelope is output poorly, much noise will appear in the picture. Then the tracking will lose precision and the playback picture will be

distorted by any slight variation of the tracking control circuit.

**Equipment Required:**

**Post Adjustment Driver (VFK0329)**

1. Insert the alignment tape.
2. Press and hold VCR/TV button and CH DOWN buttons on VCR together over 5 seconds in power off condition.  
The power comes on and the unit goes into service mode.
3. Play back the alignment tape.
4. To enter Tracking center mode, press PLAY button in Play back mode.  
"TRACKING CENTER" will be displayed on the TV monitor.
5. Connect the oscilloscope to TP3002 on the Video Signal Process Section of the Main C.B.A. Use TP6205 as a trigger.
6. Confirm that the RF envelope is flat enough ( $V1/V\text{-max.}$  is 0.7 or more).  
If not, with Post Adjustment Driver, adjust P2 and P3 post height so that the envelope waveform becomes as flat ( $V1/V\text{-max.}$  is 0.7 or more) as possible (No envelope drop). If the envelope drop appears on the left-half of the waveform, adjust P2 post height. If the envelope drop appears on the right-half of the waveform, adjust P3 post height.

**CAUTION:**

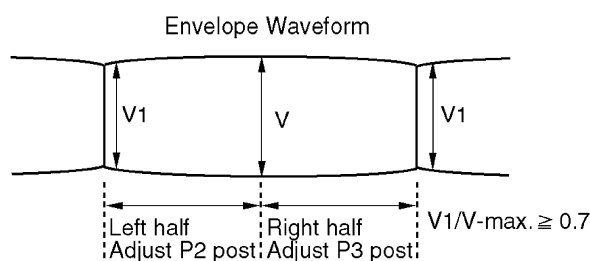
Overtightening P2 and P3 posts may cause the threads to strip.

**Note:**

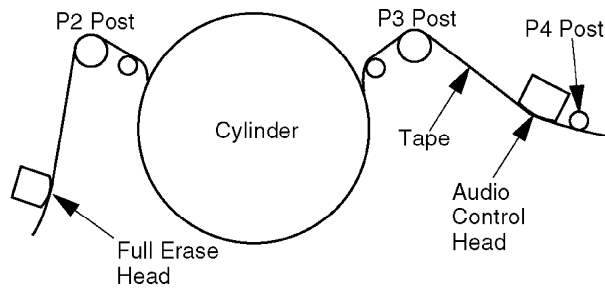
It will be possible to confirm Step 6 according to following steps.

1. Release the Tracking center mode.
2. Press the Tracking Control Up or Down button on remote control.  
Make sure that the envelope waveform remains flat. If not, readjust P2 and/or P3 post heights.

**Fig. M4-1**

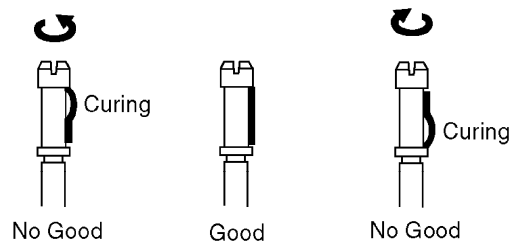


**Fig. M4-2**



**7. After adjustment, confirm that the tape travels without curling at P2 and P3 posts.**

**Fig. M4-3**



**8. To release from Tracking center mode, press PLAY or STOP button.**

#### **7.2.2.3.2. AUDIO CONTROL HEAD TILT ADJUSTMENT**

##### **Purpose:**

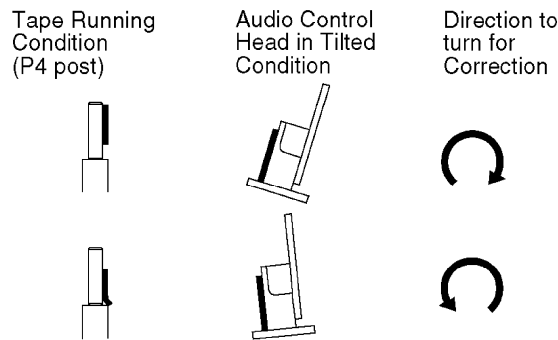
To confirm that the tape runs smoothly. In particular, confirm that the tape properly picks up the Audio Signal at the upper part of the head and the Control Signal at the lower part of the head.

##### **Symptom of Misadjustment:**

If the tilt of the Audio Control Head is poorly adjusted, the tape will eventually be damaged. An intermittent Blue screen may be seen in Playback.

- 1. Play back a T120 cassette tape and check that the tape travels smoothly between the upper and lower guides of the P4 post.**
- 2. If necessary, adjust Black Screw (B) clockwise until the tape begins to curl at the lower edge of the P4 post. Then adjust the screw counterclockwise until the curling is eliminated.**

**Fig. M5**



#### 7.2.2.3.3. AUDIO CONTROL HEAD HEIGHT ADJUSTMENT

The height of the Audio Control Head replacement part is preset at the factory.

##### **Purpose:**

To be sure the tape runs properly along the Control Head.

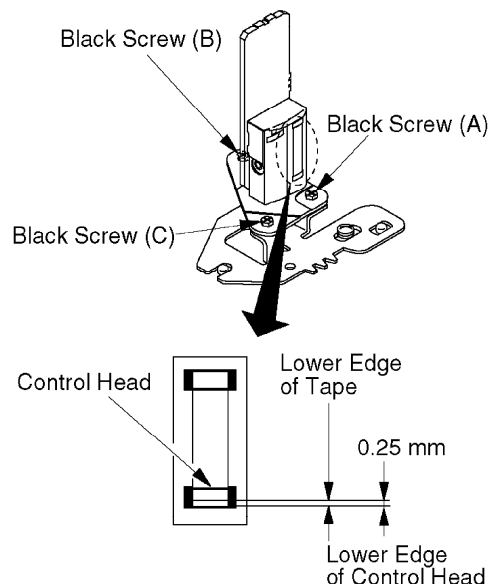
##### **Symptom of Misadjustment:**

If the control signal is not properly picked up, Servo Operation cannot be achieved. A Blue screen will be seen in Playback.

This confirmation is required when the Audio Control Head is replaced.

1. Play back a T120 cassette tape and check that the lower edge of the tape runs approximately 0.25 mm above the lower edge of the Audio Control Head.
2. If necessary, adjust Black Screws (A) and (B) clockwise to lower the tape or counterclockwise to raise.

Fig. M6



#### 7.2.2.3.4. AUDIO CONTROL HEAD AZIMUTH ADJUSTMENT

##### **Purpose:**

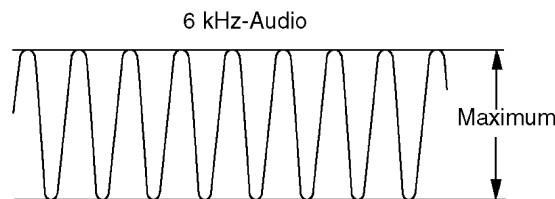
To adjust the position and height of the Audio Control Head so that it meets the tape tracks properly.

**Symptom of Misadjustment:**

If the position of the Audio Control Head is not properly adjusted, the Audio S/N Ratio is poor.

1. Connect the oscilloscope to the audio output jack on the rear side of the deck.
2. Play back the 6 kHz Monaural Audio portion of the alignment tape.
3. Adjust Black Screw (C) on the Audio Control Head base so that the output level is at maximum.

**Fig. M7**



4. Confirm the height of the Audio Control Head is proper. If not, readjust Black Screws (A) and (B).

**7.2.2.3.5. AUDIO CONTROL HEAD HORIZONTAL POSITION ADJUSTMENT**

**Purpose:**

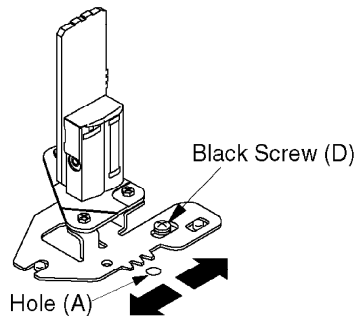
To adjust the Horizontal Position of the Audio Control Head.

**Symptom of Misadjustment:**

If the Horizontal Position of the Audio Control Head is not properly adjusted, a maximum envelope cannot be obtained at the Neutral Position of the Tracking Control Circuit.

1. Insert the alignment tape.
2. Press and hold VCR/TV button and CH DOWN buttons on VCR together over 5 seconds in power off condition.  
The power comes on and the unit goes into service mode.
3. Play back the alignment tape.
4. To enter Tracking center mode, press PLAY button in Play back mode.  
"TRACKING CENTER" will be displayed on the TV monitor.
5. Connect the oscilloscope to TP3002 on the Video Signal Process Section of the Main C.B.A. Use TP6205 as a trigger.
6. Loosen the Black Screw (D) and tighten it slightly. Set the H-Position Adjustment Driver into the Hole (A). Then slowly turn the fixture either clockwise or counterclockwise so that the envelope is at maximum.

**Fig. M8**



**7. Tighten Black Screw (D).**

**8. To release from Tracking center mode, press PLAY or STOP button.**

**Note:**

**Old type of H-Position Adjustment Driver (VFK0136) can be used for this adjustment.**

### **7.3. ELECTRICAL ADJUSTMENT**

#### **7.3.1. EVR (Electronic Variable Resister) ADJUSTMENT WITH THE REMOTE CONTROL**

This unit has electronic technology using I2C Bus concept. The PG SHIFTER ADJUSTMENT is adjusted by using " On Screen Display " and the remote control instead of adjusting mechanical controls (VR).

#### **7.3.2. TEST EQUIPMENT**

To do all of these electrical adjustments, the following equipment is required.

##### **1. Dual-Trace Oscilloscope**

**Voltage Range: 0.001 V to 50 V/Div.**

**Frequency Range: DC to 50 MHz**

**Probes: 10:1, 1:1**

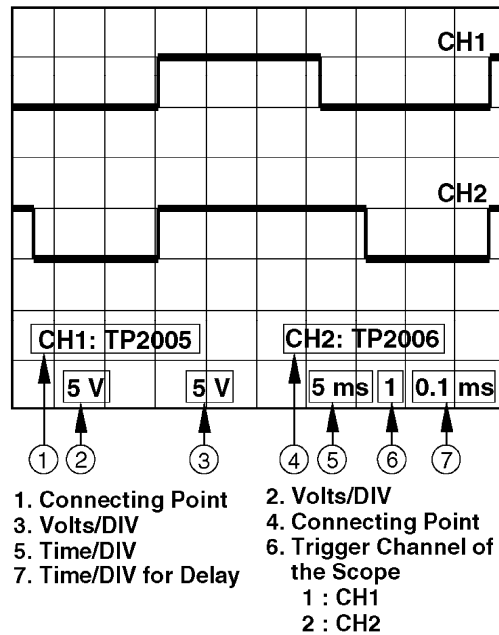
##### **2. Isolation Transformer (Variable)**

##### **3. VHS Alignment Tape (VFMS0003H6)**

##### **4. TV monitor**

#### **7.3.3. HOW TO READ THE ADJUSTMENT PROCEDURES**

**Fig.E1**



#### 7.3.4. PG SHIFTER ADJUSTMENT

##### Purpose:

Determine the Video Head Switching Point during Playback.

##### Symptom of Misadjustment:

May cause Head Switching Noise and/or Vertical Jitter.

##### Test Point :

TP3001 (Main C.B.A.),

TP6205 (Main C.B.A.)

##### Specification:

$T = 6 H \pm 0.5 H$  (0.38 ms  $\pm$  0.03 ms) Mode : SP Playback

##### Mode :

SP Playback

##### Equipment :

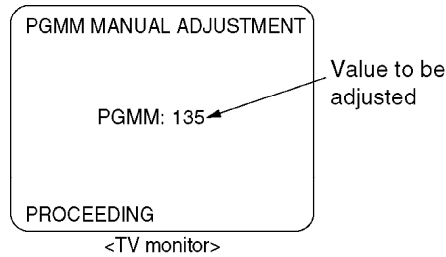
Oscilloscope,

VHS Alignment Tape (VFMS0003H6),

TV monitor

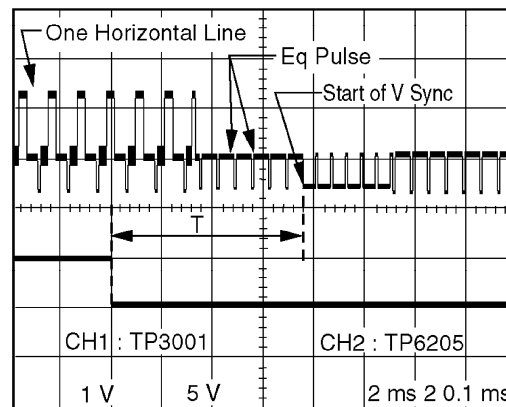
1. Insert the VHS Alignment Tape and play back in SP mode.
2. Press VCR/TV button on the unit and 3 button on the remote control together to enter EVR PG SHIFTER ADJUSTMENT Mode. Then, "PGMM MANUAL ADJUSTMENT" menu will appear on the TV monitor.

Fig.E2-1



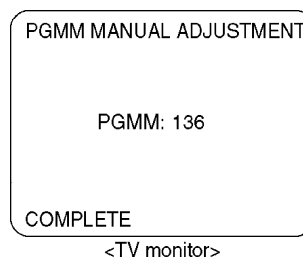
3. Connect the channel-1 scope probe to TP3001 and the channel-2 scope probe to TP6205. Used TP6205 as a trigger.
4. Adjust value so that the trailing edge of the head switching pulse is placed  $6 H \pm 0.5 H$  ( $0.38 \text{ ms} \pm 0.03 \text{ ms}$ ) before the start of the vertical sync pulse by pressing CH UP and CH DOWN buttons on the remote control.

Fig.E2-2



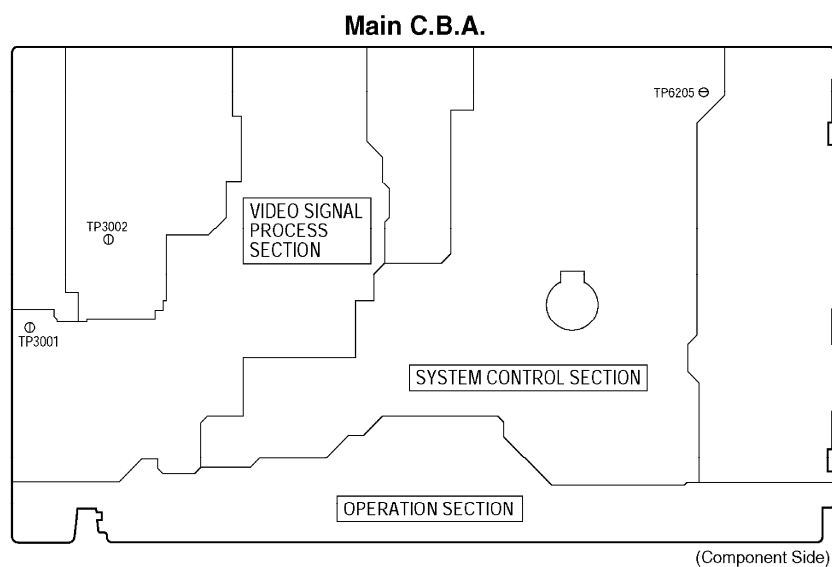
5. After adjustment is completed, press REC button on the remote control. Then " COMPLETE " will appear on the TV monitor and adjusted value will be written to Memory IC (IC6005).

Fig.E2-3



6. Press STOP button on the remote control to release from EVR PG SHIFTER ADJUSTMENT MODE.

## 7.4. TEST POINTS AND CONTROL LOCATION



FUNCTION OF IMPORTANT TEST POINTS	
TP3001	Video Signal to Jack
TP3002	REC/PB Video envelope signal
TP6205	Head SW.

#### Test Point Information

⊙ Test Point with a jumper wire across a hole in the P.C.B.

## 8. SCHEMATIC DIAGRAMS

### 8.1. SCHEMATIC DIAGRAM & CIRCUIT BOARD LAYOUT NOTES

### 8.2. MAIN SCHEMATIC DIAGRAMS

( Model: PVQ-V201, PV-V4021, PV-V4021-K, VHQ-401, VHQ-41M, PV-V4521-K )

( Model: PV-V4511, PV-V4521, PV-V4521-K, VHQ-451, PV-V4611 )

### 8.3. CAPSTAN STATOR SCHEMATIC DIAGRAM

### 8.4. INTERCONNECTION SCHEMATIC DIAGRAM

### 8.5. SIGNAL WAVEFORMS

## **8.6. VOLTAGE CHART**

# **9. CIRCUIT BOARD LAYOUT**

## **9.1. MAIN C.B.A.**

( Model: PVQ-V201, PV-V4021, PV-V4021-K, VHQ-401, VHQ-41M, PV-V4521-K )

( Model: PV-V4511, PV-V4521, PV-V4521-K, VHQ-451, PV-V4611 )

## **9.2. CAPSTAN STATOR**

# **10. BLOCK DIAGRAMS**

## **10.1. POWER SUPPLY BLOCK DIAGRAM**

## **10.2. VIDEO SIGNAL PATH BLOCK DIAGRAM**

## **10.3. AUDIO SIGNAL PROCESS BLOCK DIAGRAM**

## **10.4. Hi-Fi AUDIO SIGNAL PATH BLOCK DIAGRAM**

## **10.5. SYSTEM CONTROL BLOCK DIAGRAM**

## **10.6. SERVO BLOCK DIAGRAM**

## **10.7. OPERATION BLOCK DIAGRAM**

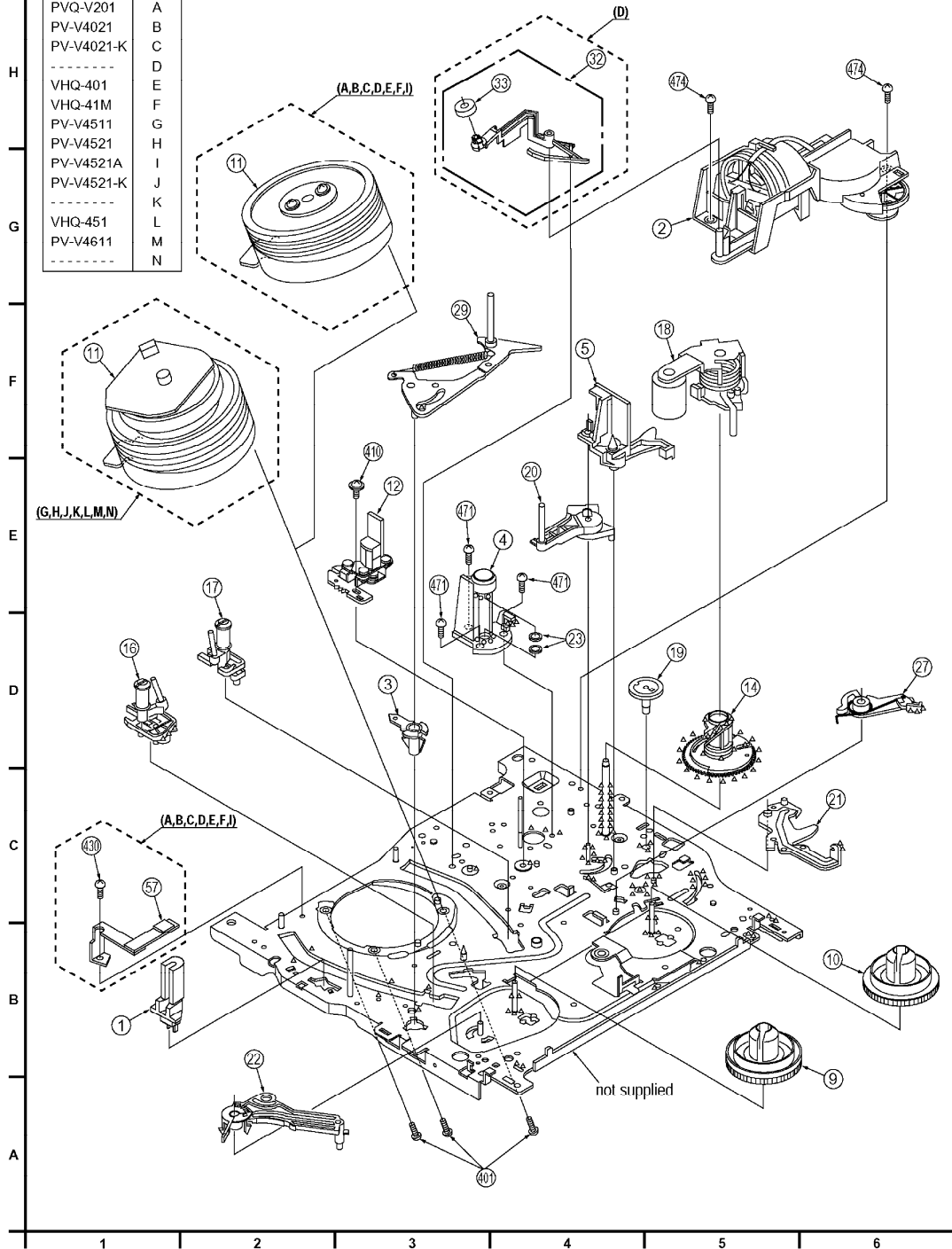
# **11. EXPLODED VIEWS**

## **11.1. MECHANISM (TOP) SECTION**

## ① MECHANISM (TOP) SECTION

COMPARISON CHART  
OF MODELS & MARKS

MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N



### LUBRICATION POINTS

When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Mark	Kind of Lubricant	Availability	Part Number
○ ○ ○	Spindle Oil	Purchase from Local Supplier	-----
△ △ △	Grease	Available from Factory	VFKS0081

Note: Parts with no Ref. No. in "EXPLODED VIEWS" are not supplied. And some Ref. No. will be skipped. Be sure to make your orders of replacement parts according to the parts list.

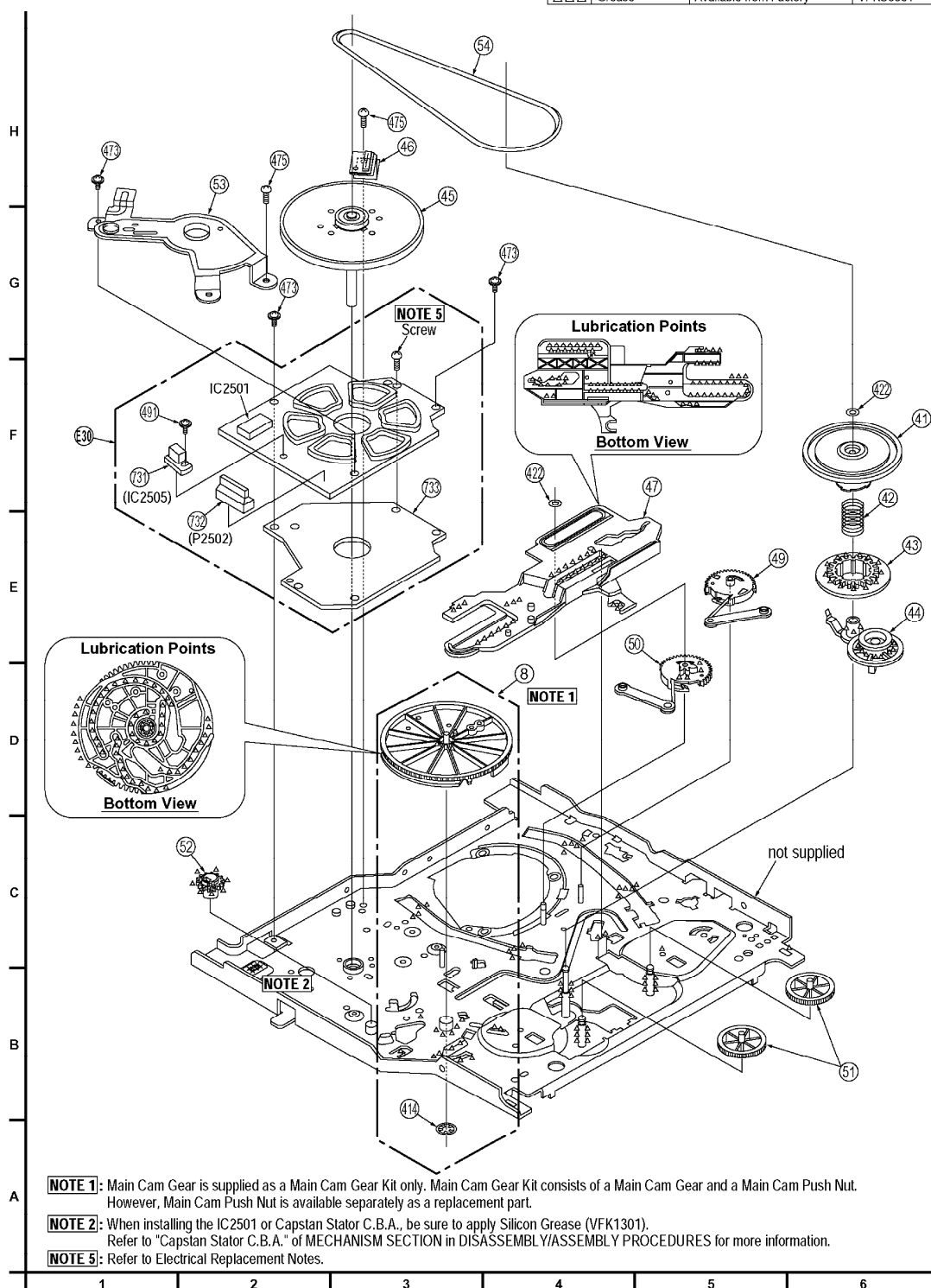
## 11.2. MECHANISM (BOTTOM) SECTION

## ② MECHANISM (BOTTOM) SECTION

### LUBRICATION POINTS

When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Mark	Kind of Lubricant	Availability	Part Number
XXX	Silicon Grease	Available from Factory	VFK1301
△△△	Grease	Available from Factory	VFKS0081



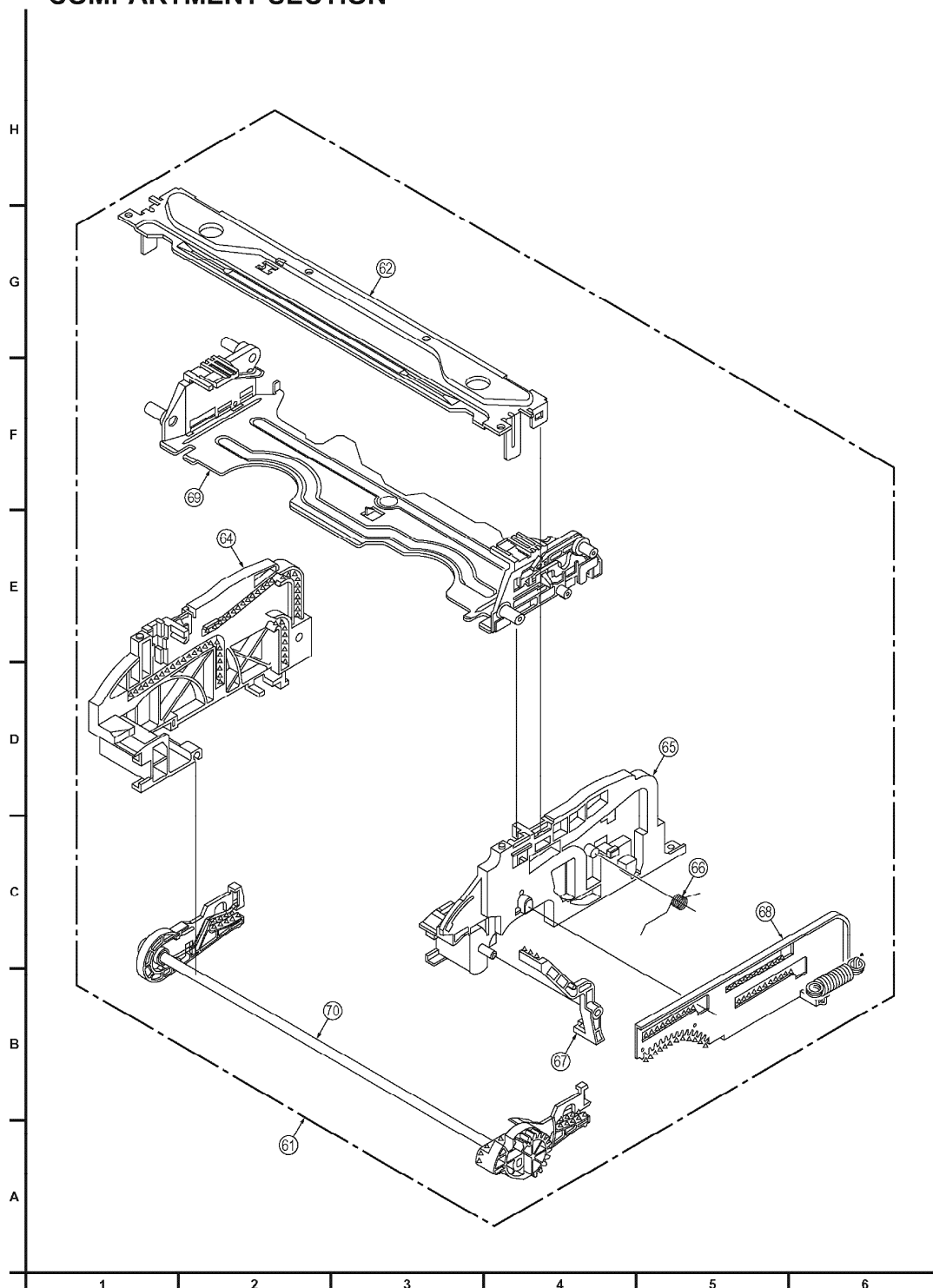
## 11.3. CASSETTE UP COMPARTMENT SECTION

### ③ CASSETTE UP COMPARTMENT SECTION

#### LUBRICATION POINTS

When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.


Mark	Kind of Lubricant	Availability	Part Number
△△△	Grease	Available from Factory	VFKS0081



## 11.4. CHASSIS FRAME AND CASING PARTS SECTION

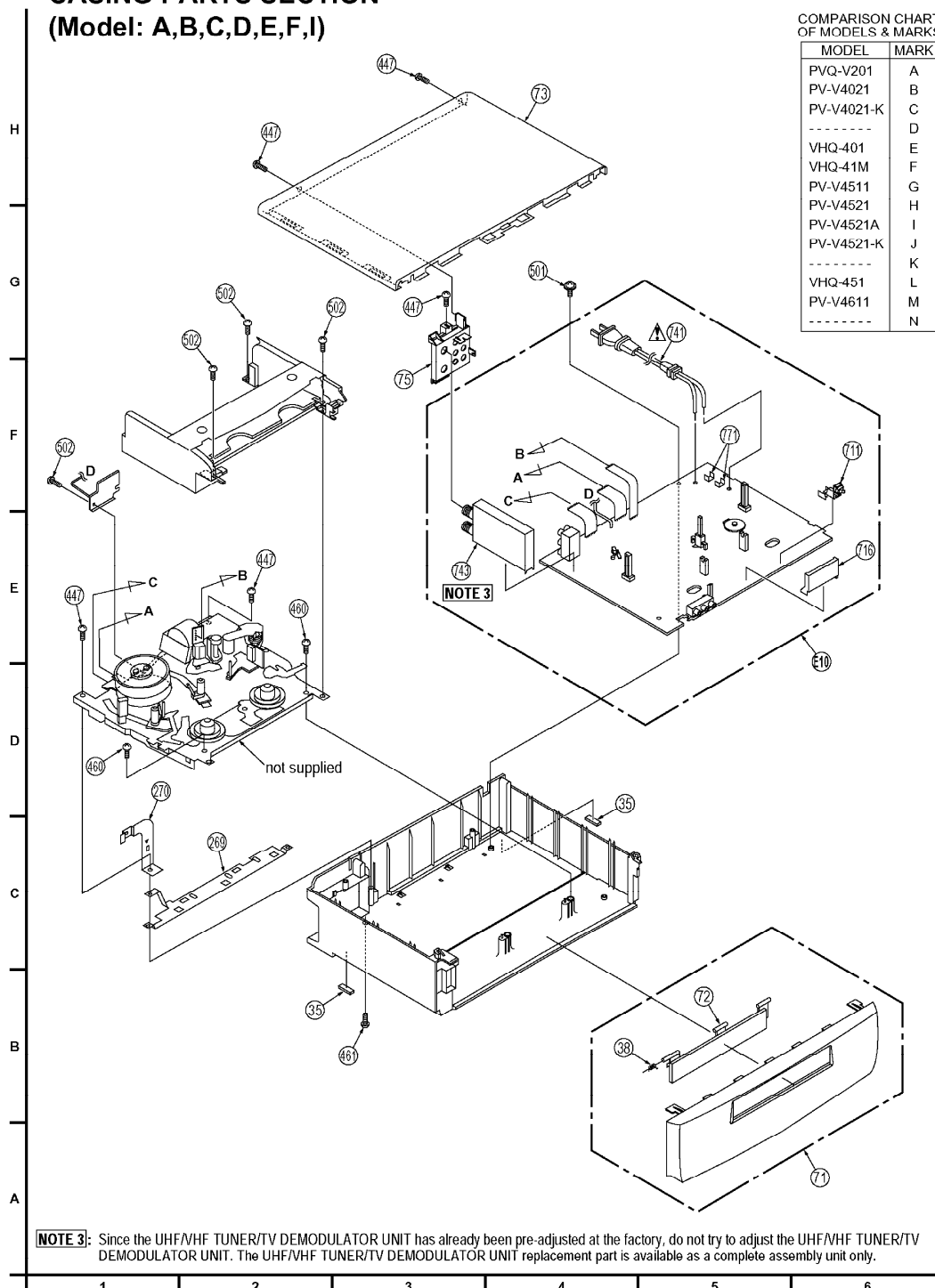
( Model: PVQ-V201, PV-V4021, PV-V4021-K, VHQ-401, PV-V4511, PV-V4521A )

#### 4 CHASSIS FRAME AND CASING PARTS SECTION (Model: A,B,C,D,E,F,I)

**IMPORTANT SAFETY NOTICE**  
COMPONENTS IDENTIFIED BY THE SIGN  HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

COMPARISON CHART OF MODELS & MARKS


MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N



( Model: PV-V4511, PV-V4521, PV-V4521-K, VHQ-451 )

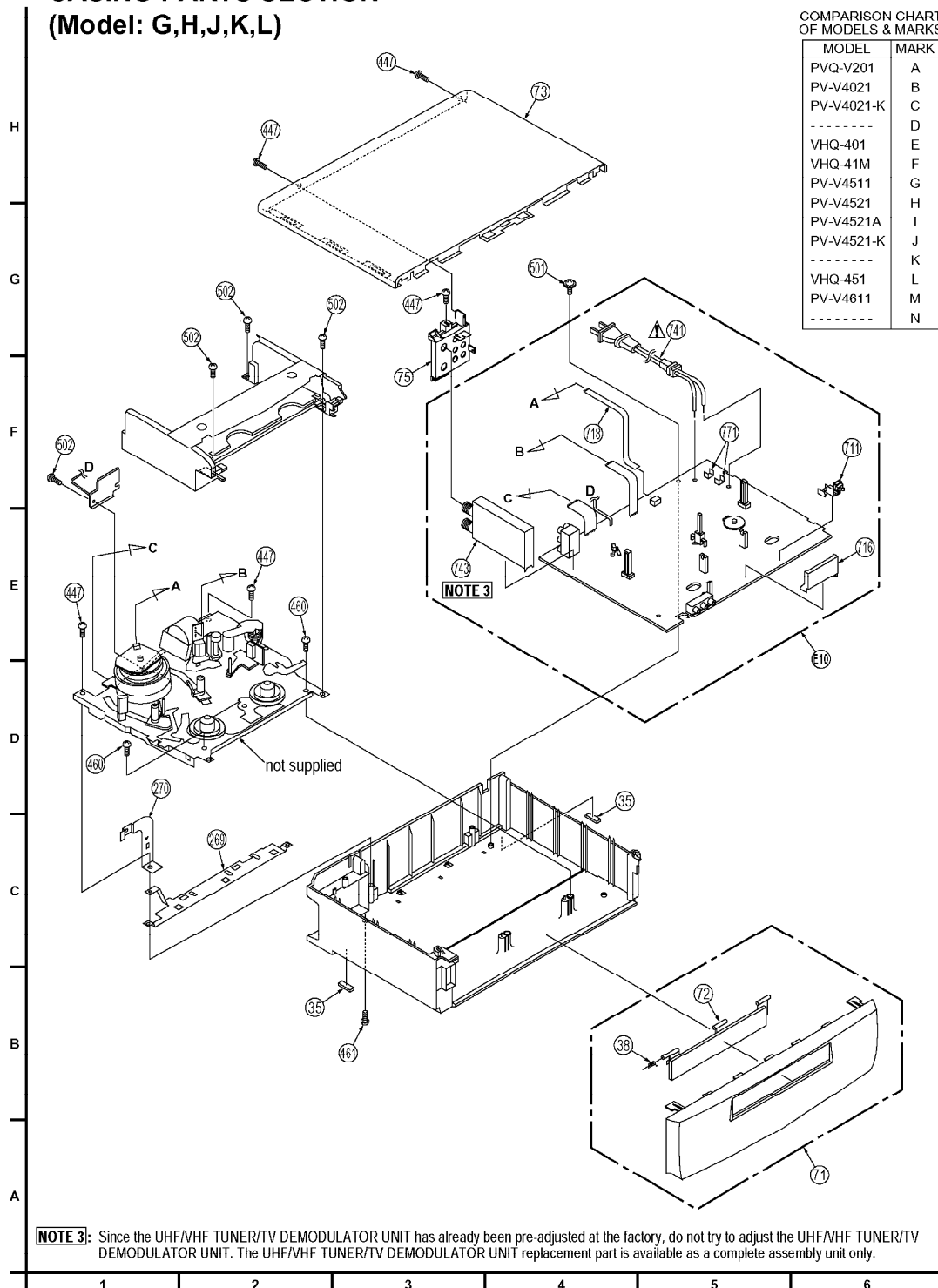
# **4 CHASSIS FRAME AND CASING PARTS SECTION** (Model: G,H,J,K,L)

## **IMPORTANT SAFETY NOTICE**

COMPONENTS IDENTIFIED BY THE SIGN  HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

COMPARISON CHART OF MODELS & MARKS


MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N



( Model: PV-V4611 )

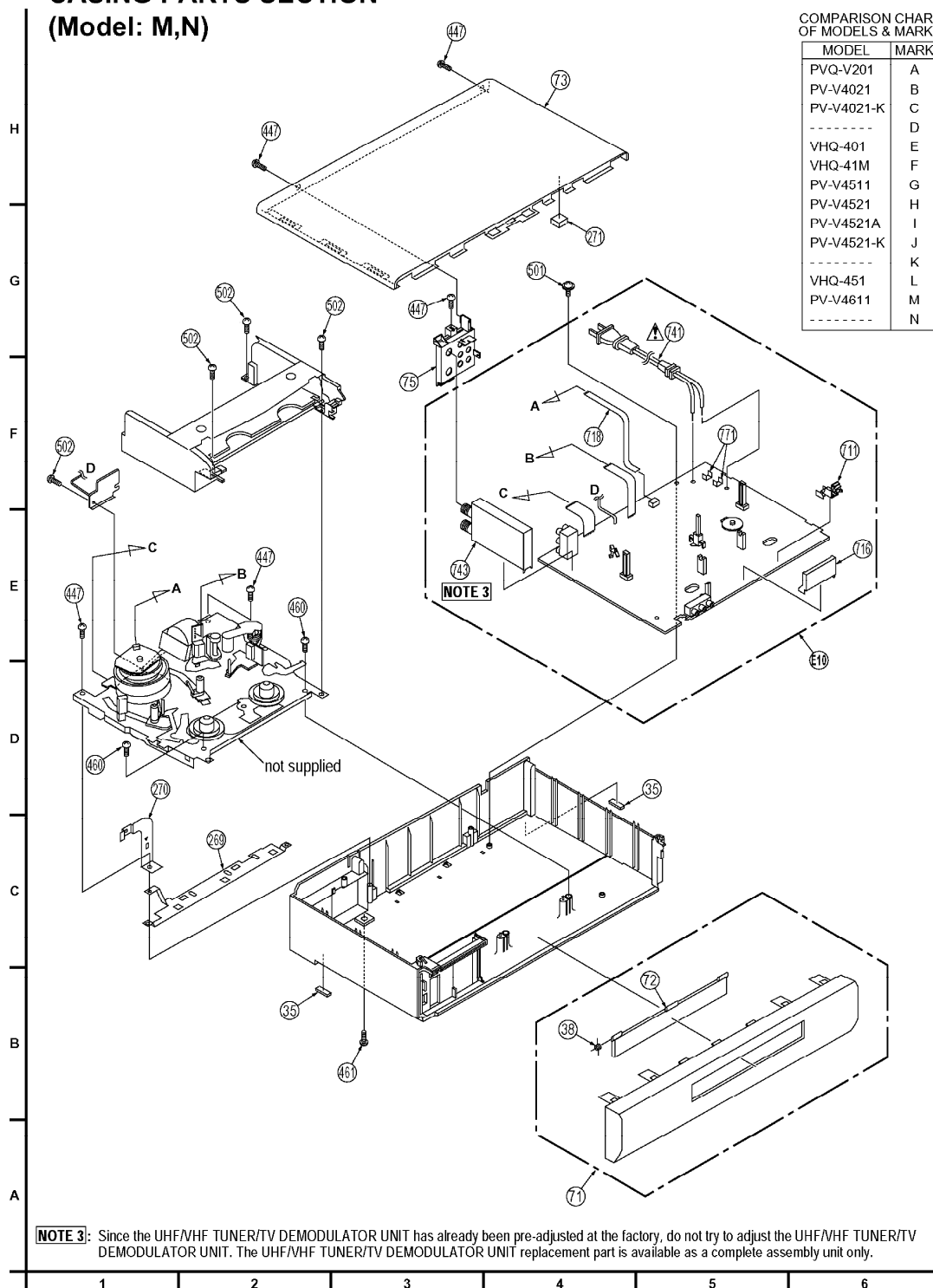
#### 4 CHASSIS FRAME AND CASING PARTS SECTION (Model: M,N)

##### IMPORTANT SAFETY NOTICE

COMPONENTS IDENTIFIED BY THE SIGN  HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

COMPARISON CHART OF MODELS & MARKS

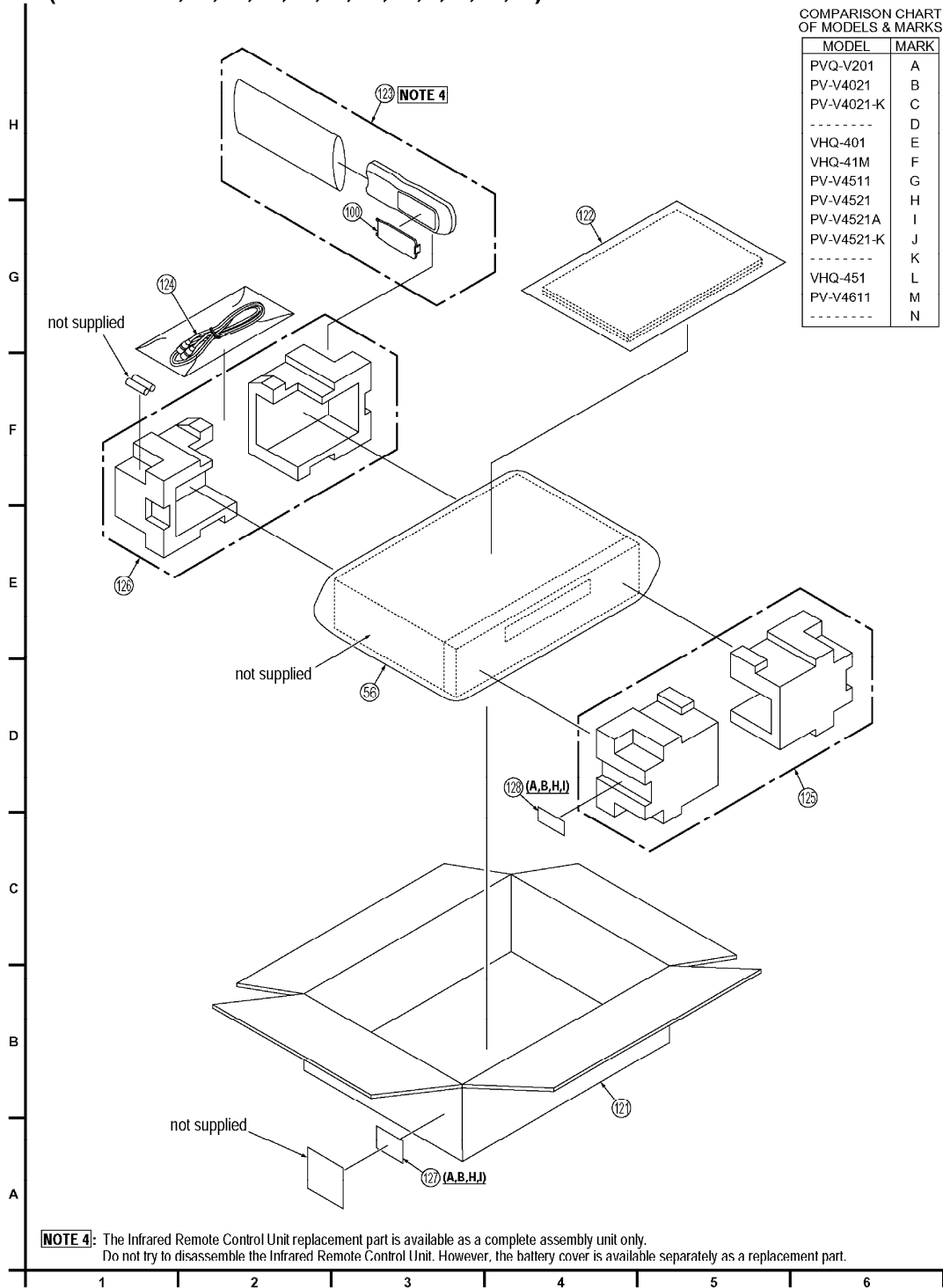
MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N



### 11.5. PACKING PARTS AND ACCESSORIES SECTION

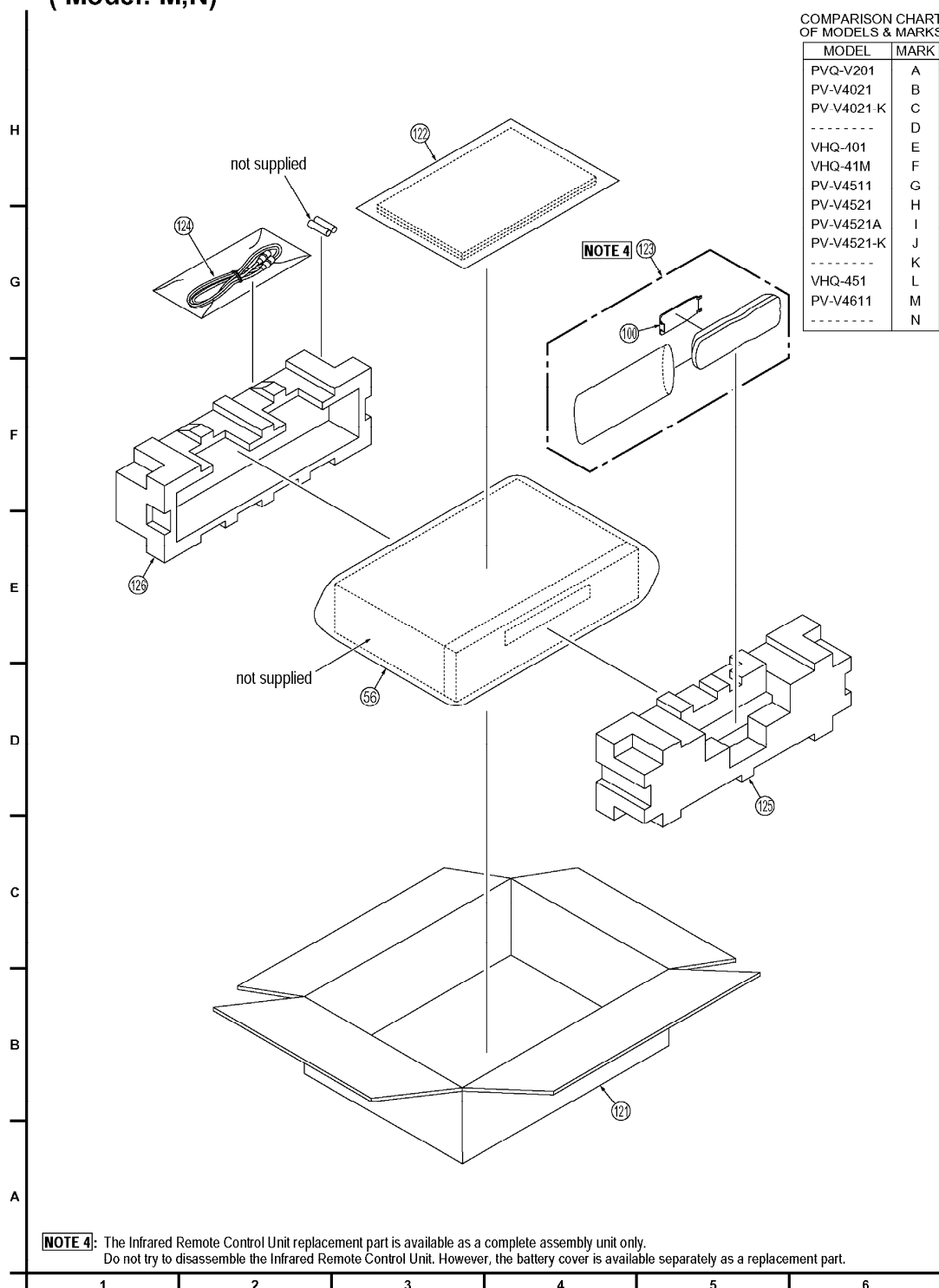
( Model: PVQ-V201, PV-V4021, PV-V4021-K, VHQ-401, VHQ-41M, PV-V4511, PV-V4521, PV-V4521A, PV-V4521-K, VHQ-451 )

# **⑤ PACKING PARTS AND ACCESSORIES SECTION** **( Model: A, B, C, D, E, F, G, H, I, J, K, L )**



**( Model: PV-V4611 )**

## 5 PACKING PARTS AND ACCESSORIES SECTION ( Model: M,N)



## 12. REPLACEMENT PARTS LISTS

BEFORE REPLACING PARTS, READ THE FOLLOWING:

### 12.1. REPLACEMENT NOTES

#### 12.1.1. General Notes

#### 1. Use only original replacement parts:

To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list.

## 2. IMPORTANT SAFETY NOTICE

Components identified by the sign  have special characteristics important for safety. When replacing any of these components, use only the specified parts.

## 3. SPECIAL NOTE

All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" section of this service manual.

4. Parts with no Ref. No. in "EXPLODED VIEWS" are not supplied. And some Ref. No. will be skipped. Be sure to make your orders of replacement parts according to the parts list.

5. Parts different in shape or size may be used. However, only interchangeable parts will be supplied as service replacement parts.

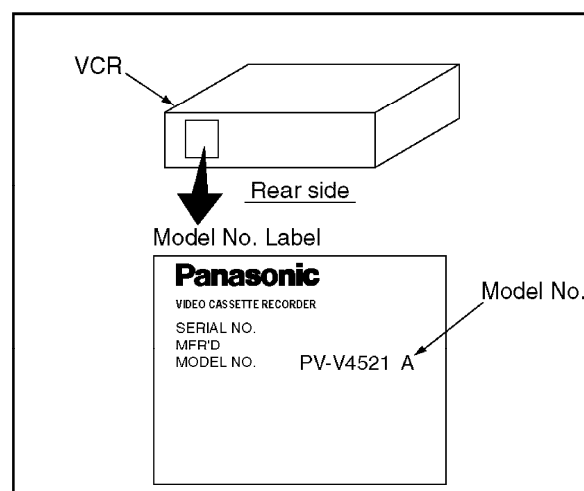
6. All of parts are supplied from MKI.

7. Item numbers with capital letter E (Example: E10, E20,...) in the Ref. No. column are shown in the ex-ploded views.

## 8. Model Number Indication:

The model number is indicated on the Model No. Label which is located on the rear side of the Cabinet.

Differences between PV-V4521 and PV-V4521A are as below.



- Cylinder Unit (Ref. No. 11)

- Grounding Plate Unit (Ref. No. 57)
- Screw (Ref. No. 430)
- Flexible Flat Cable (Ref. No. 718)
- Main C.B.A. (Ref. No. E10)

When ordering these, be sure to confirm the model number printed on the Model No. Label and order the proper parts according to the replacement parts list.

#### 12.1.2. Mechanical Replacement Notes

1. Section No. of parts shown in Exploded Views are indicated in the Remarks column.
2. Main Cam Gear is supplied as a Main Cam Gear Kit (Ref. No. 8) only. Main Cam Gear Kit consists of a Main Cam Gear and a Main Cam Push Nut. However, Main Cam Push Nut is available separately as a replacement part.
3. The Infrared Remote Control Unit (Ref. No. 123) replacement part is available as a complete assembly unit only. Do not try to disassemble the Infrared Remote Control Unit. However, the battery cover is available separately as a replacement part.
4. Main Cam Push Nut (Ref. No. 414) is not reusable. If removed, install a new one.

#### 12.1.3. Electrical Replacement Notes

1. Unless otherwise specified;  
All resistors are in  $\Omega$  , K = 1,000  $\Omega$  , M = 1,000 k  $\Omega$  .

#### 2. Abbreviation

##### RTL:

Retention Time Limited

This indicates that the retention time is limited for this item. After the discontinuation of this item in production, it will no longer be available.

##### NR:

Non Repairable Board Ass'y

##### MGF CHIP:

Metal Glaze Film Chip

##### C CHIP:

Ceramic Chip

**COMPLX CMP:**

**Complex Component**

**W FLMPRF:**

**Wirewound Flameproof**

**C.B.A.:**

**Circuit Board Assembly**

**P.C.B.:**

**Printed Circuit Board**

**E.S.D.:**

**Electrostatically Sensitive Devices**

**3. SERVICE OF CHIP PARTS**

When servicing chip parts, please use a soldering iron of less than 30 W. Refer to "IC, TRANSISTOR AND CHIP PART INFORMATION" page.

4. When replacing 0  $\Omega$  resistor, a wire can be substituted for it.

5. When installing the IC2501 (AN3846SC) or Capstan

Stator C.B.A., be sure to apply Silicon Grease (VFK1301). Refer to "Capstan Stator C.B.A." of MECHANISM SECTION in DISASSEMBLY/ ASSEMBLY PROCEDURES.

6. Since the UHF/VHF TUNER/TV DEMODULATOR UNIT (Ref. No. 743) has already been pre-adjusted at the factory, do not try to adjust the UHF/VHF TUNER/TV DEMODULATOR UNIT. The UHF/VHF TUNER/TV DEMODULATOR UNIT replacement part is available as a complete assembly unit only.

7. EEP ROM IC (IC6005), MAIN C.B.A. replacement note: After replacing EEP ROM IC (IC6005) or MAIN C.B.A., be sure to write the initial data with remote control.

8. The Capstan Stator C.B.A. (Ref. No. E30) as a service part is supplied with the Screw installed on it. Please note that there is no functional difference between the units with or without the Screw.

**COMPARISON CHART OF MODELS & MARKS**

MODEL	MARK	MODEL	MARK
PVQ-V201	A	PV-V4521	H
PV-V4021	B	PV-V4521A	I
PV-V4021-K	C	PV-V4521-K	J
-----	D	-----	K
VHQ-401	E	VHQ-451	L
VHQ-41M	F	PV-V4611	M
PV-V4511	G	-----	N

**12.2. MECHANICAL REPLACEMENT PARTS LIST****COMPARISON CHART OF MODELS & MARKS**

MODEL	MARK	MODEL	MARK
PVQ-V201	A	PV-V4521	H
PV-V4021	B	PV-V4521A	I
PV-V4021-K	C	PV-V4521-K	J
-----	D	-----	K
VHQ-401	E	VHQ-451	L
VHQ-41M	F	PV-V4611	M
PV-V4511	G	-----	N





**MECHANICAL REPLACEMENT PARTS**

Ref. No.	Part No.	Part Name & Description	Remarks
<u>1</u>	VBSS0033	FULL ERASE HEAD	1
<u>2</u>	VXKS0901	MOTOR BLOCK UNIT	1
<u>3</u>	LSDB0045	TENSION ARM BOSS	1
<u>4</u>	VXDS0212	CAPSTAN HOLDER UNIT	1
<u>5</u>	LSMD0209	OPENER PIECE	1
<u>8</u>	VVGS0009	MAIN CAM GEAR KIT	2
<u>9</u>	LSDR0002	S REEL TABLE	1
<u>9</u>	LSDR0004	S REEL TABLE	1
<u>10</u>	LSDR0003	T REEL TABLE	1
<u>10</u>	LSDR0005	T REEL TABLE	1
<u>11</u>	VEGS0453	CYLINDER UNIT ( A )	1
<u>11</u>	VEGS0454	CYLINDER UNIT ( B,C,D,E,F )	1
<u>11</u>	VEGS0470	CYLINDER UNIT ( G,H,J,K,L,M,N )	1
<u>11</u>	VEGS0455	CYLINDER UNIT ( I )	1
<u>12</u>	VEHS0596	AUDIO CONTROL/ERASE HEAD UNIT ( A,B,C,D,E,F )	1
<u>12</u>	VEHS0598	AUDIO CONTROL/ERASE HEAD UNIT ( G,H,I,J,K,L,M,N )	1
<u>14</u>	LSDG0112	LIFT GEAR	1
<u>16</u>	VXDS0213	LOADING POST BASE-S UNIT	1
<u>17</u>	VXDS0214	LOADING POST BASE-T UNIT	1
<u>18</u>	VXLS1094	PINCH ARM UNIT	1
<u>19</u>	LSDG0110	INTERMEDIATE GEAR A	1
<u>20</u>	VXLS1101	P5 ARM UNIT	1
<u>21</u>	LSML0131	DRIVE RACK ARM	1
<u>22</u>	VXLS1103	TENSION CONTROL ARM UNIT	1
<u>23</u>	LSMX0129	OIL SEAL	1
<u>27</u>	VXLS1100	T BRAKE UNIT	1
<u>29</u>	VXLS1102	TENSION ARM UNIT	1
<u>32</u>	VXLS1104	CLEANER ARM UNIT ( D )	1
<u>33</u>	VDPS0269	CLEANER ROLLER ( D )	1
<u>35</u>	LSKA0012	RUBBER FOOT	4

Ref. No.	Part No.	Part Name & Description	Remarks
38	LSMB0217	CASSETTE DOOR SPRING	4
41	VXPS0389	CENTER CLUTCH UNIT	2
42	VMBS1151	CHANGING GEAR SPRING	2
43	LSDG0114	CHANGING GEAR	2
44	VXLS1091	IDLER ARM UNIT	2
45	VXPS0391	CAPSTAN ROTOR UNIT	2
46	LSMA0387	STOPPER ANGLE	2
47	LSMM0003	MAIN ROD	2
49	VXLS1099	S LOADING ARM UNIT	2
50	VXLS1098	T LOADING ARM UNIT	2
51	LSDG0116	REEL GEAR	2
52	LSDG0111	INTERMEDIATE GEAR B	2
53	LSMA0423	SUPPORT ANGLE	2
54	LSDV0007	CAPSTAN BELT SQUARE,RUBBER 2MM	2
56	LSPF0056	SHEET,POLYETHYLENE	5
57	VXSS0010	GROUNDING PLATE UNIT ( A,B,C,D,E,F,I )	1
61	VXYS1347	CASSETTE UP ASS'Y	3
62	LSMA0352	TOP PLATE	3
64	LSMD0174	SIDE PLATE L	3
65	LSMD0173	SIDE PLATE R	3
66	LSMB0218	SUPPORT SPRING	3
67	LSML0096	OPENER LEVER	3
68	VXLS1111	DRIVE RACK UNIT	3
69	VXAS4423	HOLDER UNIT	3
70	VXLS1110	WIPER ARM UNIT	3
71	VYPS7081	FRONT PANEL ASS'Y ( A )	4
71	VYPS7079	FRONT PANEL ASS'Y ( B,C,D,K )	4
71	VYPS7082	FRONT PANEL ASS'Y ( E )	4
71	VYPS7090	FRONT PANEL ASS'Y ( F )	4
71	VYPS7096	FRONT PANEL ASS'Y ( G )	4
71	VYPS7080	FRONT PANEL ASS'Y ( H,I,J )	4
71	VYPS7083	FRONT PANEL ASS'Y ( L )	4
71	VYPS7087	FRONT PANEL ASS'Y ( M )	4
71	VYPS7093	FRONT PANEL ASS'Y ( N )	4
72	VYPS7086	CASSETTE DOOR-LID UNIT ( A )	4
72	VYPS7084	CASSETTE DOOR-LID UNIT ( B,C,D,K )	4
72	LSGP0262	CASSETTE DOOR-LID ( E,F )	4
72	VYPS7085	CASSETTE DOOR-LID UNIT ( G,H,I,J,M,N )	4
72	LSGP0263	CASSETTE DOOR-LID ( L )	4
73	LSKM0521	TOP COVER ( A,B,C,D,E,F,G,H,I,J,K,L )	4
73	LSKM0559	TOP COVER ( M,N )	4
75	LSGP0244	REAR PANEL ( A,B,C,D,E,F )	4
75	LSGP0243	REAR PANEL ( G,H,I,J,K,L,M,N )	4
100	LSKF0322	BATTERY COVER ( A,B,D,E,F,G,H,I,L )	5
100	VKFS2235	BATTERY COVER ( C,J,M,N )	5
100	LSKF0310	BATTERY COVER ( K )	5
121	LSPG0998	PACKING CASE,PAPER ( A )	5
121	LSPG0999	PACKING CASE,PAPER ( B )	5
121	LSPG1097	PACKING CASE,PAPER ( C )	5
121	LSPG1062	PACKING CASE,PAPER ( D )	5
121	LSPG1001	PACKING CASE,PAPER ( E )	5
121	LSPG1065	PACKING CASE,PAPER ( F )	5
121	LSPG1066	PACKING CASE,PAPER ( G )	5
121	LSPG1000	PACKING CASE,PAPER ( H,I )	5
121	LSPG1098	PACKING CASE,PAPER ( J )	5
121	LSPG1063	PACKING CASE,PAPER ( K )	5
121	LSPG1002	PACKING CASE,PAPER ( L )	5



Ref. No.	Part No.	Part Name & Description	Remarks
<u>121</u>	LSPG1044	PACKING CASE,PAPER ( M )	5
121	LSPG1104	PACKING CASE,PAPER ( N )	5
<u>122</u>	LSQF0327	FAN BAG ( A )	5
122	LSQF0329	FAN BAG ( B,H,I )	5
122	LSQF0383	FAN BAG ( C,J )	5
122	LSQF0372	FAN BAG ( D )	5
122	LSQF0330	FAN BAG ( E,L )	5
122	LSQF0376	FAN BAG ( F )	5
122	LSQF0374	FAN BAG ( G )	5
122	LSQF0373	FAN BAG ( K )	5
<u>122</u>	LSQF0367	FAN BAG ( M )	5
122	LSQF0385	FAN BAG ( N )	5
<u>123</u>	LSSQ0263	INFRARED REMOTE CONTROL UNIT ( A,B,D )	5
123	LSSQ0289	INFRARED REMOTE CONTROL UNIT ( C )	5
123	LSSQ0265	INFRARED REMOTE CONTROL UNIT ( E,F )	5
123	LSSQ0264	INFRARED REMOTE CONTROL UNIT ( G,H,I )	5
123	LSSQ0290	INFRARED REMOTE CONTROL UNIT ( J,N )	5
123	LSSQ0285	INFRARED REMOTE CONTROL UNIT ( K )	5
123	LSSQ0266	INFRARED REMOTE CONTROL UNIT ( L )	5
<u>123</u>	LSSQ0286	INFRARED REMOTE CONTROL UNIT ( M )	5
<u>124</u>	LSJA0372	VHF CONNECTING CABLE W/PLUG,0V	5
<u>124</u>	LSJA0328	VHF CONNECTING CABLE W/PLUG,0V	5
124	LSJA0274	VHF CONNECTING CABLE W/PLUG,0V	5
124	VJAS0212	VHF CONNECTING CABLE W/PLUG,0V	5
<u>125</u>	LSPN0209	FRONT CUSHION,STYROFOAM ( A,B,D,E,F,G,H,I,L )	5
125	LSPN0230	FRONT CUSHION,STYROFOAM ( C,J,K )	5
<u>125</u>	LSPN0169	FRONT CUSHION,STYROFOAM ( M,N )	5
<u>126</u>	LSPN0210	REAR CUSHION,STYROFOAM ( A,B,D,E,F,G,H,I,L )	5
126	LSPN0231	REAR CUSHION,STYROFOAM ( C,J,K )	5
<u>126</u>	LSPN0152	REAR CUSHION,STYROFOAM ( M,N )	5
<u>127</u>	CPS-1C	CHECK POINT LABEL ( A,B,H,I )	5
<u>128</u>	N9ZZ00000027	SECURITY TAG ( A,B,H,I )	5
<u>269</u>	LSSC0425	GROUNDING PLATE	4
<u>270</u>	LSSC0426	GROUNDING PLATE	4
<u>271</u>	LSGQ0041	CUSHION,PLASTIC ( M,N )	4
<u>401</u>	VHDS0475	SCREW,STEEL	1
<u>410</u>	VHDS0498	SCREW W/WASHER,STEEL	1
<u>414</u>	VHNS0070	MAIN CAM PUSH NUT,STEEL	2
<u>422</u>	XWGV2D5G	WASHER,NYLON	2
<u>430</u>	XTV26+6FFZJ	TAPPING SCREW,STEEL ( A,B,C,D,E,F,I )	2
<u>447</u>	VHDS0310	SCREW,STEEL	4
<u>460</u>	XTN4+12A	TAPPING SCREW,STEEL	4
<u>461</u>	VHDS0460	SCREW,STEEL	4
<u>471</u>	XSN26+5	SCREW,STEEL	1
<u>473</u>	XYN26+C6	SCREW W/WASHER,STEEL	2
<u>474</u>	LSHD0056	TAPPING SCREW,STEEL	1
<u>475</u>	XTV26+5FJ	TAPPING SCREW,STEEL	2
<u>491</u>	XYN2+J7	SCREW W/WASHER,STEEL	2
<u>501</u>	LSHD0074	SCREW W/WASHER,STEEL	4
<u>502</u>	LSHD0075	TAPPING SCREW,STEEL	4
<u>711</u>	LSSZ0004	INFRARED RECEIVER UNIT	4
<u>716</u>	LSSZ0002	LED DISPLAY PANEL ( A,E,L )	4
<u>716</u>	LSSZ0001	LED DISPLAY PANEL ( B,C,D,F,G,H,I,J,K,M,N )	4
<u>718</u>	LSJW0023	FLEXIBLE FLAT CABLE W/OUT PLUG ( G,H,J,K,L,M,N )	4
<u>731(IC2505)</u>	EZMPS300F12	MR HEAD	2
<u>732(P2502)</u>	LSJS0097	CONNECOR 12P	2
<u>733</u>	LSMA0384	BACK PLATE,STEEL	2

Ref. No.	Part No.	Part Name & Description	Remarks
741	LSJA0360	AC CORD W/PLUG,AC 120V	4 
741	LSJA0358	AC CORD W/PLUG,AC 120V	4 
741	LSJA0359	AC CORD W/PLUG,AC 120V	4 
741	LSJA0361	AC CORD W/PLUG,AC 120V	4 
743	ENG56717G1	TUNER,UHF/VHF NR	4
771	EYF52BC	FUSE HOLDER	4
E10	VEPS6071AA	MAIN C.B.A. ( A )	4 RTL
E10	VEPS6071GA	MAIN C.B.A. ( B,D )	4 RTL
E10	VEPS6071GD	MAIN C.B.A. ( C )	4 RTL
E10	VEPS6071GB	MAIN C.B.A. ( E )	4 RTL
E10	VEPS6071GE	MAIN C.B.A. ( F )	4 RTL
E10	VEPS6070HE	MAIN C.B.A. ( G )	4 RTL
E10	VEPS6070HB	MAIN C.B.A. ( H )	4 RTL
E10	VEPS6071HA	MAIN C.B.A. ( I )	4 RTL
E10	VEPS6070HK	MAIN C.B.A. ( J )	4 RTL
E10	VEPS6070HD	MAIN C.B.A. ( K )	4 RTL
E10	VEPS6070HA	MAIN C.B.A. ( L )	4 RTL
E10	VEPS6070HC	MAIN C.B.A. ( M )	4 RTL
E10	VEPS6070HH	MAIN C.B.A. ( N )	4 RTL
E30	VEMS0342	CAPSTAN STATOR C.B.A. NR	2

#### SERVICE FIXTURES AND TOOLS

Ref. No.	Part No.	Part Name & Description	Remarks
	VFMS0003H6	VHS ALIGNMENT TAPE	
	VFKS0081	GREASE	
	VFK0329	POST ADJUSTMENT DRIVER	
	VFK1301	SILICON GREASE	
	VFK27	HEAD CLEANING STICK	
	VFK0330	H-POSITION ADJUSTMENT DRIVER	

## 12.3. ELECTRICAL REPLACEMENT PARTS LIST

#### COMPARISON CHART OF MODELS & MARKS

MODEL	MARK	MODEL	MARK
PVQ-V201	A	PV-V4521	H
PV-V4021	B	PV-V4521A	I
PV-V4021-K	C	PV-V4521-K	J
-----	D	-----	K
VHQ-401	E	VHQ-451	L
VHQ-41M	F	PV-V4611	M
PV-V4511	G	-----	N

#### PRINTED CIRCUIT BOARD ASSEMBLY




Ref. No.	Part No.	Part Name & Description	Remarks
E10	VEPS6071AA	MAIN C.B.A. ( A )	E.S.D. RTL
E10	VEPS6071GA	MAIN C.B.A. ( B,D )	E.S.D. RTL
E10	VEPS6071GD	MAIN C.B.A. ( C )	E.S.D. RTL
E10	VEPS6071GB	MAIN C.B.A. ( E )	E.S.D. RTL
E10	VEPS6071GE	MAIN C.B.A. ( F )	E.S.D. RTL
E10	VEPS6070HE	MAIN C.B.A. ( G )	E.S.D. RTL
E10	VEPS6070HB	MAIN C.B.A. ( H )	E.S.D. RTL
E10	VEPS6071HA	MAIN C.B.A. ( I )	E.S.D. RTL
E10	VEPS6070HK	MAIN C.B.A. ( J )	E.S.D. RTL
E10	VEPS6070HD	MAIN C.B.A. ( K )	E.S.D. RTL
E10	VEPS6070HA	MAIN C.B.A. ( L )	E.S.D. RTL
E10	VEPS6070HC	MAIN C.B.A. ( M )	E.S.D. RTL
E10	VEPS6070HH	MAIN C.B.A. ( N )	E.S.D. RTL
E30	VEMS0342	CAPSTAN STATOR C.B.A. NR	

### 12.3.1. MAIN C.B.A. ( Model: A,B,C,D,E,F,I )

#### COMPARISON CHART OF MODELS & MARKS

MODEL	MARK	MODEL	MARK
PVQ-V201	A	PV-V4521	H
PV-V4021	B	PV-V4521A	I
PV-V4021-K	C	PV-V4521-K	J
-----	D	-----	K
VHQ-401	E	VHQ-451	L
VHQ-41M	F	PV-V4611	M
PV-V4511	G	-----	N

#### INTEGRATED CIRCUITS






Ref. No.	Part No.	Part Name & Description	Remarks
IC1001	0N3131-R.KT	IC, LINEAR	
IC1001	PS2501-1-X	IC, LINEAR	
IC1001	0N3131-S.KT	IC, LINEAR	
IC1002	TA76431AS	IC, LINEAR	
IC1002	TA76431ASTP6	IC, LINEAR	
IC2601	AN3808K	IC, LINEAR	
IC3001	NN13400A	IC, LINEAR	
IC3101	MN3885S	IC, CCD	E.S.D.
IC4151	BU4053BCF	IC, CMOS STANDARD LOGIC ( B,C,D,F )	E.S.D.
IC4151	CD4053BCM	IC, CMOS STANDARD LOGIC ( B,C,D,F )	E.S.D.
IC4201	AN3663FBP-V	IC, LINEAR ( I )	
IC6001	MN101D02FPA	IC, 8BIT MICROCONTROLLER	E.S.D.
IC6002	RPI-303	PHOTO INTERRUPTER	
IC6003	RPI-303	PHOTO INTERRUPTER	
IC6004	PST3147NR	IC, CMOS STANDARD LOGIC	E.S.D.
IC6004	XC61CC4702MR	IC, CMOS STANDARD LOGIC	E.S.D.
IC6005	KS24C011CS	IC, 1K EEP ROM	E.S.D.
IC6005	AT24C01A10SI	IC, 1K EEP ROM	E.S.D.
IC6005	BR24C01AF-E2	IC, 1K EEP ROM	E.S.D.
IC6005	BR24C01AFWE2	IC, 1K EEP ROM	E.S.D.
IC6005	KS24C011IS	IC, 1K EEP ROM	E.S.D.
IC6005	M24C01-MN6	IC, 1K EEP ROM	E.S.D.
IC6301	PT6957E	IC, LOGIC ( B,C,D,F,I )	E.S.D.

## TRANSISTORS

Ref. No.	Part No.	Part Name & Description	Remarks
Q1001	2SC4533LP.KT	TRANSISTOR SI NPN	
Q1001	2SC5130LF608	TRANSISTOR SI NPN	
Q1002	2SD1458	TRANSISTOR SI NPN	
Q1002	2SD2259	TRANSISTOR SI NPN	
Q1051	2SD2159(T)	TRANSISTOR SI NPN	
Q1051	2SD1581(T)	TRANSISTOR SI NPN	
Q1052	2SD601A(RS)	TRANSISTOR SI NPN CHIP	
Q1052	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q1053	2SD235800A	TRANSISTOR SI NPN CHIP	
Q1053	2SD2097TV2R	TRANSISTOR SI NPN CHIP	
Q3001	2SB709A	TRANSISTOR SI PNP CHIP	
Q3001	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q3002	2SB709A(RS)	TRANSISTOR SI PNP CHIP	
Q3002	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q3003	2SD601A(RS)	TRANSISTOR SI NPN CHIP	
Q3003	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q4001	2SB1218ARS	TRANSISTOR SI PNP CHIP	
Q4001	2SA1576A106R	TRANSISTOR SI PNP CHIP	
Q4002	2SD1819ARS	TRANSISTOR SI NPN CHIP	
Q4003	2SD1819ARS	TRANSISTOR SI NPN CHIP	
Q4101	2SD601A(RS)	TRANSISTOR SI NPN CHIP	
Q4101	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q4151	UN5212	TRANSISTOR SI NPN CHIP ( B,C,D,F )	
Q4151	DTC124EUA106	TRANSISTOR SI NPN CHIP ( B,C,D,F )	
Q4151	MUN5212T1	TRANSISTOR SI NPN CHIP ( B,C,D,F )	
Q6001	2SD1819ARS	TRANSISTOR SI NPN CHIP	
Q6001	2SC4081T106R	TRANSISTOR SI NPN CHIP	
Q6002	2SB709A(RS)	TRANSISTOR SI PNP CHIP	
Q6002	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q6003	2SD1819ARS	TRANSISTOR SI NPN CHIP	
Q6003	2SC4081T106R	TRANSISTOR SI NPN CHIP	
Q6005	2SB709A(RS)	TRANSISTOR SI PNP CHIP	
Q6005	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q6006	2SD1819ARS	TRANSISTOR SI NPN CHIP	
Q6006	2SC4081T106R	TRANSISTOR SI NPN CHIP	
Q6009	VEKS5707	PHOTO SENSOR UNIT	
Q6010	VEKS5707	PHOTO SENSOR UNIT	
Q6301	IMT17-T110	TRANSISTOR COMPLX CMP SI PNP CHIP ( B,C,D,F,I )	
Q6302	IMT17-T110	TRANSISTOR COMPLX CMP SI PNP CHIP ( B,C,D,F,I )	
Q6303	2SB709A	TRANSISTOR SI PNP CHIP ( B,C,D,F,I )	
Q6303	2SA1037K146R	TRANSISTOR SI PNP CHIP ( B,C,D,F,I )	
Q6502	2SD601A	TRANSISTOR SI NPN CHIP ( A,E )	
Q6502	2SC2412K146R	TRANSISTOR SI NPN CHIP ( A,E )	
Q6503	2SD601A	TRANSISTOR SI NPN CHIP ( A,E )	
Q6503	2SC2412K146R	TRANSISTOR SI NPN CHIP ( A,E )	
Q6504	2SD601A	TRANSISTOR SI NPN CHIP ( A,E )	
Q6504	2SC2412K146R	TRANSISTOR SI NPN CHIP ( A,E )	
Q6505	2SD601A	TRANSISTOR SI NPN CHIP ( A,E )	
Q6505	2SC2412K146R	TRANSISTOR SI NPN CHIP ( A,E )	
Q6508	2SB709A	TRANSISTOR SI PNP CHIP ( A,E )	
Q6508	2SA1037K146R	TRANSISTOR SI PNP CHIP ( A,E )	
Q6509	2SD601A	TRANSISTOR SI NPN CHIP ( A,E )	
Q6509	2SC2412K146R	TRANSISTOR SI NPN CHIP ( A,E )	

Ref. No.	Part No.	Part Name & Description	Remarks
Q6510	2SD601A	TRANSISTOR SI NPN CHIP ( A,E )	
Q6510	2SC2412K146R	TRANSISTOR SI NPN CHIP ( A,E )	

## DIODES

Ref. No.	Part No.	Part Name & Description	Remarks
D1001	DB105G	DIODE SI	
D1001	S1NB60-4101	DIODE SI	
D1002	ERA18-04	DIODE SI	
D1002	EG01	DIODE SI	
D1003	ERA18-04	DIODE SI	
D1003	EG01	DIODE SI	
D1005	ERA18-04	DIODE SI	
D1005	EG01	DIODE SI	
D1006	ERB32-01L3	DIODE SI	
D1006	RGP15GL-5088	DIODE SI	
D1006	RU2YXLC1	DIODE SI	
D1008	EC21QS03L-TE	DIODE SI	
D1008	D1FM3	DIODE SI	
D1008	SFPJ-63	DIODE SI	
D1008	U2FWJ44M	DIODE SI	
D1009	D1FS4	DIODE SI	
D1009	EC10QS03L	DIODE SI	
D1009	EP10QY03	DIODE SI	
D1009	SFPJ-53	DIODE SI	
D1009	U1FWJ44N	DIODE SI	
D1015	MA2180LA	DIODE ZENER 18V	
D1015	1N4746A-T	DIODE ZENER 18V	
D1015	1N4746ARL	DIODE ZENER 18V	
D1016	MA165	DIODE SI	
D1016	1SS119	DIODE SI	
D1016	1SS133T	DIODE SI	
D1051	MA4110N-H	DIODE ZENER 11V	
D3006	MA4051-M	DIODE ZENER 5.1V ( B,C,D,F,I )	
D3006	04AZ5.1ZTPA7	DIODE ZENER 5.1V ( B,C,D,F,I )	
D3007	MA4051-M	DIODE ZENER 5.1V ( B,C,D,F,I )	
D3007	04AZ5.1ZTPA7	DIODE ZENER 5.1V ( B,C,D,F,I )	
D4209	MA165	DIODE SI ( I )	
D4209	1SS119	DIODE SI ( I )	
D4209	1SS133T	DIODE SI ( I )	
D6001	VEKS5708	SENSOR LED UNIT	
D6003	MA165	DIODE SI	
D6003	1SS119	DIODE SI	
D6003	1SS133T	DIODE SI	
D6325	MA165	DIODE SI	
D6325	1SS119	DIODE SI	
D6325	1SS133T	DIODE SI	
D6326	MA165	DIODE SI	
D6326	1SS119	DIODE SI	
D6326	1SS133T	DIODE SI	

## RESISTORS

Ref. No.	Part No.	Part Name & Description	Remarks
R1001	VRESC2TK275	CARBON 1/2W 2.7M	
R1001	VRESC2TK275C	CARBON 1/2W 2.7M	
R1001	VRESC2TK275T	CARBON 1/2W 2.7M	
R1003	VRESE2TJ334	CARBON 1/2W 330K	
R1004	ERG2SJ333H	METAL OXIDE 2W 33K	
R1005	ERG1SJ560P	METAL OXIDE 1W 56	
R1006	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R1007	ERDS2TJ101	CARBON 1/4W 100	
R1008	ERDS2TJ392	CARBON 1/4W 3.9K	
R1010	ERD25FJ100P	CARBON 1/4W 10	
R1010	ERD25FPJ100P	CARBON 1/4W 10	
R1010	VRESF4FJ100P	CARBON 1/4W 10	
R1014	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R1015	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R1016	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R1017	VRJSD6D2431V	MGF CHIP 1/10W 2.43K	
R1018	VRJSD6D2201V	MGF CHIP 1/10W 2.2K	
R1019	ERDS2T0	CARBON 1/4W 0	
R1025	ERDS2TJ300	CARBON 1/4W 30	
R1026	ERDS2TJ300	CARBON 1/4W 30	
R1051	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R1052	ERDS2TJ153	CARBON 1/4W 15K	
R1053	ERDS2TJ153	CARBON 1/4W 15K	
R1057	ERDS2TJ331	CARBON 1/4W 330	
R1058	ERDS2TJ104	CARBON 1/4W 100K	
R2601	ERJ6GEYJ330V	MGF CHIP 1/10W 33	
R2602	ERJ6GEYJ330V	MGF CHIP 1/10W 33	
R2603	ERJ6GEYJ330V	MGF CHIP 1/10W 33	
R2604	ERDS2TJ1R0	CARBON 1/4W 1.0	
R2605	ERDS2TJ1R2	CARBON 1/4W 1.2	
R2606	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R3001	ERJ6GEYJ750V	MGF CHIP 1/10W 75 ( B,C,D,F,I )	
R3002	ERDS2TJ561	CARBON 1/4W 560	
R3003	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R3004	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3006	ERDS2TJ152	CARBON 1/4W 1.5K	
R3007	ERDS2TJ152	CARBON 1/4W 1.5K	
R3008	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R3009	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R3022	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R3023	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R3027	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R3029	ERJ6GEYJ125V	MGF CHIP 1/10W 1.2M	
R3031	ERJ6GEYJ474V	MGF CHIP 1/10W 470K	
R3033	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R3034	ERJ6GEYJ121V	MGF CHIP 1/10W 120	
R3035	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R3036	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R3037	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K ( A )	
R3038	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K ( A )	
R3039	ERJ6GEYJ332V	MGF CHIP 1/10W 3.3K ( A )	
R3040	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K ( A )	
R3041	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3053	ERJ6GEYJ154V	MGF CHIP 1/10W 150K ( A )	
R3053	ERJ6GEYJ684V	MGF CHIP 1/10W 680K ( B,C,D,E,F,I )	

\_\_\_\_\_















Ref. No.	Part No.	Part Name & Description	Remarks
R3301	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R3302	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R3305	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R4001	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4002	ERJ6GEYJ334V	MGF CHIP 1/10W 330K	
R4003	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R4004	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4005	ERJ6GEYJ225V	MGF CHIP 1/10W 2.2M	
R4006	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R4007	ERJ6GEYJ821V	MGF CHIP 1/10W 820	
R4008	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R4009	ERJ6GEYJ473V	MGF CHIP 1/10W 47K ( A,B,C,D,E,F )	
R4010	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( I )	
R4010	ERJ6GEYJ473V	MGF CHIP 1/10W 47K ( A,B,C,D,E,F )	
R4011	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R4012	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R4013	ERJ6GEYJ331V	MGF CHIP 1/10W 330 ( A,B,C,D,E,F )	
R4014	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R4015	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R4017	ERJ6GEYJ101V	MGF CHIP 1/10W 100 ( A,B,C,D,E,F )	
R4017	ERJ6GEYJ102V	MGF CHIP 1/10W 1K ( I )	
R4018	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K ( A,B,C,D,E,F )	
R4028	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R4102	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4103	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R4151	ERJ6GEYJ101V	MGF CHIP 1/10W 100 ( B,C,D,F )	
R4152	ERJ6GEYJ101V	MGF CHIP 1/10W 100 ( B,C,D,F )	
R4153	ERJ6GEYJ104V	MGF CHIP 1/10W 100K ( B,C,D,F )	
R4154	ERJ6GEYJ104V	MGF CHIP 1/10W 100K ( B,C,D,F )	
R4155	ERJ6GEYJ104V	MGF CHIP 1/10W 100K ( B,C,D,F )	
R4156	ERJ6GEYJ104V	MGF CHIP 1/10W 100K ( B,C,D,F )	
R4157	ERJ6GEYJ104V	MGF CHIP 1/10W 100K ( B,C,D,F )	
R4158	ERJ6GEYJ104V	MGF CHIP 1/10W 100K ( B,C,D,F )	
R4161	ERJ6GEYJ223V	MGF CHIP 1/10W 22K ( B,C,D,F )	
R4201	ERJ6GEYJ473V	MGF CHIP 1/10W 47K ( I )	
R4202	ERJ6GEYJ473V	MGF CHIP 1/10W 47K ( I )	
R4203	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K ( I )	
R4204	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K ( I )	
R4205	ERJ6GEYJ473V	MGF CHIP 1/10W 47K ( I )	
R4206	ERJ6GEYJ473V	MGF CHIP 1/10W 47K ( I )	
R4207	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K ( I )	
R4208	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K ( I )	
R4209	ERJ6GEYJ102V	MGF CHIP 1/10W 1K ( I )	
R4210	ERJ6GEYJ102V	MGF CHIP 1/10W 1K ( I )	
R4213	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( I )	
R4214	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( I )	
R4218	ERJ6GEYJ102V	MGF CHIP 1/10W 1K ( I )	
R4223	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( I )	
R4224	ERJ6GEYJ333V	MGF CHIP 1/10W 33K ( I )	
R4225	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( I )	
R4226	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K ( I )	
R4228	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( I )	
R4453	ERJ6GEYJ333V	MGF CHIP 1/10W 33K ( I )	
R4455	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K ( I )	
R6001	ERDS2TJ101	CARBON 1/4W 100	
R6003	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R6006	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	



Ref. No.	Part No.	Part Name & Description	Remarks
R6007	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K	
R6010	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R6012	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6016	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6019	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6022	ERJ6GEYJ273V	MGF CHIP 1/10W 27K	
R6024	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R6025	ERJ6GEYJ332V	MGF CHIP 1/10W 3.3K	
R6026	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6027	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R6028	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6029	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R6030	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6033	ERDS2TJ681	CARBON 1/4W 680	
R6037	ERJ6GEYJ391V	MGF CHIP 1/10W 390	
R6052	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6057	ERJ6GEYJ102V	MGF CHIP 1/10W 1K ( B,C,D,F,I )	
R6059	ERJ6GEYJ102V	MGF CHIP 1/10W 1K ( B,C,D,F,I )	
R6060	ERJ6GEYJ105V	MGF CHIP 1/10W 1M	
R6062	ERJ6GEYJ153V	MGF CHIP 1/10W 15K ( B,C,D,E,F,I )	
R6063	ERJ6GEYJ153V	MGF CHIP 1/10W 15K ( B,C,D,E,F,I )	
R6064	ERJ6GEYJ153V	MGF CHIP 1/10W 15K ( B,C,D,E,F,I )	
R6066	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6069	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6070	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6071	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6072	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6073	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6074	ERDS2TJ272	CARBON 1/4W 2.7K	
R6078	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6079	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6080	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6081	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6082	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6085	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6086	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6087	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6089	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6109	ERJ6GEYJ183V	MGF CHIP 1/10W 18K	
R6110	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6115	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6116	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6202	ERJ6GEYJ274V	MGF CHIP 1/10W 270K	
R6203	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6204	ERJ6GEYJ184V	MGF CHIP 1/10W 180K	
R6205	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6224	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6228	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R6231	ERJ6GEYJ225V	MGF CHIP 1/10W 2.2M	
R6346	ERDS2TJ470	CARBON 1/4W 47	
R6364	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6365	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6366	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6367	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6368	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6369	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6370	ERJ6GEYJ121V	MGF CHIP 1/10W 120 ( B,C,D,F,I )	

Ref. No.	Part No.	Part Name & Description	Remarks
R6371	ERJ6GEYJ223V	MGF CHIP 1/10W 22K ( B,C,D,F,I )	
R6373	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K ( B,C,D,F,I )	
R6374	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K ( B,C,D,F,I )	
R6375	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K ( B,C,D,F,I )	
R6376	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K ( B,C,D,F,I )	
R6377	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K ( B,C,D,F,I )	
R6378	ERJ6GEYJ102V	MGF CHIP 1/10W 1K ( B,C,D,F,I )	
R6379	ERDS2TJ102	CARBON 1/4W 1K ( B,C,D,F,I )	
R6380	ERDS2TJ102	CARBON 1/4W 1K ( B,C,D,F,I )	
R6381	ERDS2TJ102	CARBON 1/4W 1K ( B,C,D,F,I )	
R6382	ERDS2TJ102	CARBON 1/4W 1K ( B,C,D,F,I )	
R6502	ERDS2TJ221	CARBON 1/4W 220 ( A,E )	
R6503	ERDS2TJ221	CARBON 1/4W 220 ( A,E )	
R6504	ERDS2TJ221	CARBON 1/4W 220 ( A,E )	
R6505	ERDS2TJ331	CARBON 1/4W 330 ( A,E )	
R6508	ERDS2TJ331	CARBON 1/4W 330 ( A,E )	
R6509	ERDS2TJ270	CARBON 1/4W 270 ( A,E )	
R6510	ERDS2TJ331	CARBON 1/4W 330 ( A,E )	
R6512	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( A,E )	
R6513	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( A,E )	
R6514	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( A,E )	
R6515	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( A,E )	
R6518	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( A,E )	
R6519	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( A,E )	
R6520	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( A,E )	
R6521	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( B,C,D,F,I )	
R7001	ERJ6GEYJ473V	MGF CHIP 1/10W 47K ( A,B,C,D,E,F )	

## CAPACITORS

Ref. No.	Part No.	Part Name & Description	Remarks
C1001	ECKATS103MF	CERAMIC 250V 0.01UF	
C1002	ECKATS332ME8	CERAMIC 250V 3300PF	
C1002	ECKDNB332ME8	CERAMIC 125V 3300PF	
C1002	ECKETS332ME8	CERAMIC 125V 3300PF	
C1002	VCKST3G332MX	CERAMIC 250V 3300PF	
C1002	VCKSU3D332MX	CERAMIC 125V 3300PF	
C1003	ECKATS332ME8	CERAMIC 250V 3300PF	
C1003	ECKDNB332ME8	CERAMIC 125V 3300PF	
C1003	ECKETS332ME8	CERAMIC 125V 3300PF	
C1003	VCKST3G332MX	CERAMIC 250V 3300PF	
C1003	VCKSU3D332MX	CERAMIC 125V 3300PF	
C1004	ECEA2DU820YE	ELECTROLYTIC 200V 82UF	
C1004	VCESAN2D820E	ELECTROLYTIC 200V 82UF	
C1004	VCESR2D820XE	ELECTROLYTIC 200V 82UF	
C1005	ECA2DHG4R7B	ELECTROLYTIC 200V 4.7UF	
C1006	ECKR2H221KB5	CERAMIC 500V 220PF	
C1007	ECUV1C224KBN	C CHIP 16V 0.22UF	
C1009	VCYSBRE183KX	CERAMIC 25V 0.018UF	
C1010	ECUV1H101JCN	C CHIP 50V 100PF	
C1011	ECA1HHG4R7I	ELECTROLYTIC 50V 4.7UF	

Ref. No.	Part No.	Part Name & Description	Remarks
C1012	ECEA1PEE331	ELECTROLYTIC 18V 330UF	
C1013	ECA1EM331B	ELECTROLYTIC 25V 330UF	
C1016	ECEA1PEE331	ELECTROLYTIC 18V 330UF	
C1017	ECA0JM102B	ELECTROLYTIC 6.3V 1000UF	
C1018	ECUV1E104KBN	C CHIP 25V 0.1UF	
C1019	ECEA0JEE101	ELECTROLYTIC 6.3V 100UF	
C1027	ECKATS103MF	CERAMIC 250V 0.01UF	
C1029	ECUV1H101JCN	C CHIP 50V 100PF	
C1030	VCYSBRE183KX	CERAMIC 25V 0.018UF	
C1032	ECEA0JKA221	ELECTROLYTIC 6.3V 220UF	
C1051	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C1052	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C1058	ECEA0JEE101	ELECTROLYTIC 6.3V 100UF	
C1059	ECEA1CKA470	ELECTROLYTIC 16V 47UF	
C2601	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C2602	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C2603	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C2604	ECUV1C104KBN	C CHIP 16V 0.1UF	
C2605	ECUV1C104KBN	C CHIP 16V 0.1UF	
C2606	ECUV1C104KBN	C CHIP 16V 0.1UF	
C2607	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C2608	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C2609	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C2610	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C2611	ECUV1H103KBN	C CHIP 50V 0.01UF	
C2612	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3001	ECA0JM471	ELECTROLYTIC 6.3V 470UF	
C3003	ECEA1CKA470	ELECTROLYTIC 16V 47UF	
C3004	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3014	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3015	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3017	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3018	ECUV1H181JCN	C CHIP 50V 180PF	
C3019	ECUV1H560JCN	C CHIP 50V 56PF	
C3021	ECUV1C224ZFN	C CHIP 16V 0.22UF	
C3022	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3023	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3024	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3025	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3026	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3027	ECUV1C224ZFN	C CHIP 16V 0.22UF	
C3028	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3029	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3030	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3031	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3032	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3033	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3034	ECUV1C224ZFN	C CHIP 16V 0.22UF	
C3035	ECUV1H560JCN	C CHIP 50V 56PF	
C3036	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3037	ECEA10JKA220	ELECTROLYTIC 6.3V 22UF	
C3038	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF ( B,C,D,F,I )	
C3039	ECUV1H822KBN	C CHIP 50V 8200PF	
C3043	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3044	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3045	ECUV1C474ZFN	C CHIP 16V 0.47UF	






Ref. No.	Part No.	Part Name & Description	Remarks
C3047	ECUV1H181JCN	C CHIP 50V 180PF	
C3048	ECUV1H560JCN	C CHIP 50V 56PF	
C3049	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3050	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3051	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3052	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3053	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3054	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3055	ECUV1H392KBN	C CHIP 50V 3900PF	
C3056	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3062	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3101	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3102	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3104	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3105	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3106	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3108	ECUV1H102KBN	C CHIP 50V 1000PF	
C3109	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3302	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3303	ECUV1H121JCN	C CHIP 50V 120PF	
C3306	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3308	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3501	ECUV1E104ZFN	C CHIP 25V 0.1UF ( B,C,D,E,F,I )	
C3502	ECUV1E104ZFN	C CHIP 25V 0.1UF ( B,C,D,E,F,I )	
C3503	ECUV1E104ZFN	C CHIP 25V 0.1UF ( B,C,D,E,F,I )	
C3504	ECUV1E104ZFN	C CHIP 25V 0.1UF ( B,C,D,E,F,I )	
C3505	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3506	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3507	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3508	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3513	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3514	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3515	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3516	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3517	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3518	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3519	ECUV1H102KBN	C CHIP 50V 1000PF	
C4001	ECUV1C224ZFN	C CHIP 16V 0.22UF	
C4002	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4003	ECUV1H272KBN	C CHIP 50V 2700PF	
C4004	ECUV1H103KBN	C CHIP 50V 0.01UF	
C4005	ECEA10JKA220	ELECTROLYTIC 6.3V 22UF	
C4006	ECUV1H102KBN	C CHIP 50V 1000PF	
C4007	ECEA10JKA220	ELECTROLYTIC 6.3V 22UF	
C4008	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C4009	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4010	ECUV1E273KBN	C CHIP 25V 0.027UF	
C4011	ECUV1H822KBN	C CHIP 50V 8200PF	
C4012	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4013	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4014	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4017	ECUV1H103KBN	C CHIP 50V 0.01UF ( I )	
C4018	ECEA1HKA010	ELECTROLYTIC 50V 1UF ( A,B,C,D,E,F )	
C4102	ECQB1562JF	POLYESTER 100V 5600PF	
C4103	ECUV1H103KBN	C CHIP 50V 0.01UF	
C4104	ECUV1H103KBN	C CHIP 50V 0.01UF	
C4106	ECEA1CKA220	ELECTROLYTIC 16V 22UF	



Ref. No.	Part No.	Part Name & Description	Remarks
C4151	ECEA1HKA010	ELECTROLYTIC 50V 1UF ( B,C,D,F )	
C4152	ECEA1HKA010	ELECTROLYTIC 50V 1UF ( B,C,D,F )	
C4153	ECEA1HKA010	ELECTROLYTIC 50V 1UF ( B,C,D,F )	
C4154	ECEA1CKA101	ELECTROLYTIC 16V 100UF ( B,C,D,F )	
C4155	ECUV1E104ZFN	C CHIP 25V 0.1UF ( B,C,D,F )	
C4201	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF ( I )	
C4202	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF ( I )	
C4203	ECEA0JKA330	ELECTROLYTIC 6.3V 33UF ( I )	
C4204	ECEA0JKA330	ELECTROLYTIC 6.3V 33UF ( I )	
C4205	ECEA1CKA100	ELECTROLYTIC 16V 10UF ( I )	
C4206	ECEA1CKA100	ELECTROLYTIC 16V 10UF ( I )	
C4207	ECEA1CKA100	ELECTROLYTIC 16V 10UF ( I )	
C4208	ECEA1CKA100	ELECTROLYTIC 16V 10UF ( I )	
C4209	ECEA1CKA100	ELECTROLYTIC 16V 10UF ( I )	
C4210	ECEA1CKA100	ELECTROLYTIC 16V 10UF ( I )	
C4211	ECUV1H153KBN	C CHIP 50V 0.015UF ( I )	
C4212	ECUV1H153KBN	C CHIP 50V 0.015UF ( I )	
C4213	ECEA1CKA100	ELECTROLYTIC 16V 10UF ( I )	
C4214	ECEA1CKA101	ELECTROLYTIC 16V 100UF ( I )	
C4216	ECEA1CKA100	ELECTROLYTIC 16V 10UF ( I )	
C4217	ECEA10JKA220	ELECTROLYTIC 6.3V 22UF ( I )	
C4218	ECEA1CKA100	ELECTROLYTIC 16V 10UF ( I )	
C4219	ECEA1HKA010	ELECTROLYTIC 50V 1UF ( I )	
C4227	ECUV1C224ZFN	C CHIP 16V 0.22UF ( I )	
C4229	ECUV1H103ZFN	C CHIP 50V 0.01UF ( I )	
C4230	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF ( I )	
C4451	ECUV1H103KBN	C CHIP 50V 0.01UF ( I )	
C4452	ECUV1H103KBN	C CHIP 50V 0.01UF ( I )	
C4455	ECUV1E104KBN	C CHIP 25V 0.1UF ( I )	
C4456	ECUV1E104KBN	C CHIP 25V 0.1UF ( I )	
C4459	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF ( I )	
C4901	ECEA1HKA010	ELECTROLYTIC 50V 1UF ( I )	
C4902	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF ( I )	
C4903	ECEA1HKA3R3	ELECTROLYTIC 50V 3.3UF ( I )	
C4904	ECEA1HKA3R3	ELECTROLYTIC 50V 3.3UF ( I )	
C4905	ECEA1CKA100	ELECTROLYTIC 16V 10UF ( I )	
C4906	ECEA1HKA010	ELECTROLYTIC 50V 1UF ( I )	
C4911	ECUV1E223KBN	C CHIP 25V 0.022UF ( I )	
C4912	ECUV1E104KBN	C CHIP 25V 0.1UF ( I )	
C4913	ECUV1H103KBN	C CHIP 50V 0.01UF ( I )	
C4917	ECUV1E104KBN	C CHIP 25V 0.1UF ( I )	
C4918	ECUV1E104KBN	C CHIP 25V 0.1UF ( I )	
C4919	ECUV1E104KBN	C CHIP 25V 0.1UF ( I )	
C4920	ECUV1E223KBN	C CHIP 25V 0.022UF ( I )	
C6001	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6003	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6005	ECUV1H150JCN	C CHIP 50V 15PF	
C6006	ECUV1H100CCN	C CHIP 50V 10PF	
C6019	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C6021	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C6026	ECUV1H102KBN	C CHIP 50V 1000PF	
C6027	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6033	ECUV1H104ZFN	C CHIP 50V 0.1UF	
C6201	ECUV1H332KBN	C CHIP 50V 3300PF	
C6203	ECUV1H103KBN	C CHIP 50V 0.01UF	
C6208	ECUV1C104KBN	C CHIP 16V 0.1UF	
C6214	ECUV1H102KBN	C CHIP 50V 1000PF	

Ref. No.	Part No.	Part Name & Description	Remarks
C6217	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6218	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C6221	ECEA10JKA220	ELECTROLYTIC 6.3V 22UF	
C6223	ECUV1H103KBN	C CHIP 50V 0.01UF	
C6224	VCESAM0J331	ELECTROLYTIC 6.3V 330UF	
C6228	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6231	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C6305	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C6306	ECEA0JKA331	ELECTROLYTIC 6.3V 330UF ( B,C,D,F,I )	
C6307	ECUV1E104ZFN	C CHIP 25V 0.1UF ( B,C,D,F,I )	
C6320	VCESAM0J331	ELECTROLYTIC 6.3V 330UF	
C6321	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C7001	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C7005	ECUV1E183KBN	C CHIP 25V 0.018UF ( A,B,C,D,E,F )	
C7010	ECUV1H102KBN	C CHIP 50V 1000PF	

## COILS

Ref. No.	Part No.	Part Name & Description	Remarks
L1001	ELF15N005A	LINE FILTER 0.5A 18MH	
L1001	LSLQ0287	LINE FILTER 0.5A 18MH	
L1001	VLQS0166	LINE FILTER 0.5A 18MH	
L1001	VLQS0167	LINE FILTER 0.5A 18MH	
L1001	VLQS0170	LINE FILTER 0.6A 18MH	
L1002	VLQSAB7D220K	COIL 22UH	
L1003	VLQSAB7D100K	COIL 10UH	
L1006	VLPS0083	FILTER	
L3001	ELESN470KA	COIL 47UH	
L3014	VLQSH02R390K	COIL 39UH	
L3016	ELESN330KA	COIL 33UH	
L3018	ELESN470KA	COIL 47UH	
L3101	ELESN101KA	COIL 100UH	
L3505	ELESN101KA	COIL 100UH	
L3506	ELESN101KA	COIL 100UH	
L3507	ELESN101KA	COIL 100UH	
L4001	ELELN153KA	COIL 15MH	
L4002	ELESN101KA	COIL 100UH	
L4101	ELESN471KA	COIL 470UH	
L4201	ELESN101KA	COIL 100UH ( I )	
L4451	ELESN101KA	COIL 100UH ( I )	
L6002	ELEXT101KE04	COIL 100UH	
L6301	ELESN101KA	COIL 100UH ( B,C,D,F,I )	
L6302	ELESN470KA	COIL 47UH	
L6303	ERDS2TJ3R3	CARBON 1/4W 3.3	
L7003	VLQSH02R101K	COIL 100UH	

## CRYSTAL OSCILLATOR

Ref. No.	Part No.	Part Name & Description	Remarks
X3010	VSXS0195	CRYSTAL OSCILLATOR	
X6001	VSXS0232-TB	CRYSTAL OSCILLATOR	










## PIN HEADERS

Ref. No.	Part No.	Part Name & Description	Remarks
P3501	LSJWM3N050LL	CONNECTOR CABLE W/PLUG,5VP-P ( A )	
P3501	LSJWM6N050LL	CONNECTOR CABLE W/PLUG,50V ( B,C,D,E,F )	
P3501	LSJWM9N050LL	CONNECTOR CABLE W/PLUG,5V ( I )	
P3502	LSEK0407	SHIELD PLATE UNIT	
P4001	VJSS0888	FE CONNECTOR 2P	
P4002	LSJWM6N130LL	CONNECTOR CABLE W/PLUG,65VP-P	
P6201	LSJP0089	CONNECTOR 12P	
P6202	LSJWM8N045LL	CONNECTOR CABLE W/PLUG,14V	




## SWITCHES

Ref. No.	Part No.	Part Name & Description	Remarks
SW6001	LSSH0002	LEAF SWITCH-SAFETY TAB	
SW6002	LSSS0012	MODE SELECT SWITCH	
SW6301	EVQ11A09K	PUSH SWITCH	
SW6302	EVQ11A09K	PUSH SWITCH ( A,E,F )	
SW6303	EVQ11A09K	PUSH SWITCH ( B,C,D,I )	
SW6304	EVQ11A09K	PUSH SWITCH ( A,E,F )	
SW6306	EVQ11A09K	PUSH SWITCH ( B,C,D,I )	
SW6307	EVQ11A09K	PUSH SWITCH	
SW6308	EVQ11A09K	PUSH SWITCH ( A,E,F )	
SW6309	EVQ11A09K	PUSH SWITCH	
SW6310	EVQ11A09K	PUSH SWITCH	
SW6311	EVQ11A09K	PUSH SWITCH ( A,E,F )	
SW6312	EVQ11A09K	PUSH SWITCH ( A,E,F )	
SW6313	EVQ11A09K	PUSH SWITCH ( B,C,D,I )	
SW6314	EVQ11A09K	PUSH SWITCH ( B,C,D,I )	
SW6315	EVQ11A09K	PUSH SWITCH ( B,C,D,I )	

## FUSE & PROTECTOR

Ref. No.	Part No.	Part Name & Description	Remarks
F1001	VSFS0003A16	FUSE 125V 1.6A	
F1001	VSFS0032B16	FUSE 125V 1.6A	
F1001	XBA1C16NU100	FUSE 125V 1.6A	
PR1001	UNH000600A	IC PROTECTOR 1.5A	
PR1001	ICP-N38-TP1	IC PROTECTOR 1.5A	
PR1001	LSSF009A25E	IC PROTECTOR 1.5A	
PR1002	UNH000600A	IC PROTECTOR 1.5A	
PR1002	ICP-N38-TP1	IC PROTECTOR 1.5A	
PR1002	LSSF009A25E	IC PROTECTOR 1.5A	





## TRANSFORMER

Ref. No.	Part No.	Part Name & Description	Remarks
T1001	VTPS0042-1	SW TRANSFORMER	
T1001	ETS28AD2J3NC	SW TRANSFORMER	
T1001	LSTP0105	SW TRANSFORMER	
T1001	VTPS0041-1	SW TRANSFORMER	
T4101	EIQ7QF018Q	OSC TRANSFORMER ( A,B,C,D,E,F )	
T4101	LSLT0051	TRANSFORMER ( I )	

## JACKS

Ref. No.	Part No.	Part Name & Description	Remarks
JK3001	LSJH0028	AUDIO/VIDEO JACK SOCKET ( A,B,C,D,E,F )	
JK3001	LSJH0055	Hi-Fi AUDIO/VIDEO JACK SOCKET ( I )	
JK3002	LSJH0053	AUDIO/VIDEO JACK SOCKET ( B,C,D,F )	
JK3002	LSJH0057	AUDIO/VIDEO JACK SOCKET ( I )	

## MISCELLANEOUS

Ref. No.	Part No.	Part Name & Description	Remarks
711	LSSZ0004	INFRARED RECEIVER UNIT	
716	LSSZ0002	LED DISPLAY PANEL ( A,E )	
716	LSSZ0001	LED DISPLAY PANEL ( B,C,D,F,I )	
741	LSJA0360	AC CORD W/PLUG,AC 120V	
741	LSJA0358	AC CORD W/PLUG,AC 120V	
741	LSJA0359	AC CORD W/PLUG,AC 120V	
741	LSJA0361	AC CORD W/PLUG,AC 120V	
743	ENG56717G1	TUNER,UHF/VHF NR	E.S.D.
771	EYF52BC	FUSE HOLDER	




## 12.3.2. MAIN C.B.A.

( Model: G,H,J,K,L,M,N )


### COMPARISON CHART OF MODELS & MARKS

MODEL	MARK	MODEL	MARK
PVQ-V201	A	PV-V4521	H
PV-V4021	B	PV-V4521A	I
PV-V4021-K	C	PV-V4521-K	J
-----	D	-----	K
VHQ-401	E	VHQ-451	L
VHQ-41M	F	PV-V4611	M
PV-V4511	G	-----	N

## INTEGRATED CIRCUITS






Ref. No.	Part No.	Part Name & Description	Remarks
IC1001	0N3131-R.KT	IC, LINEAR	
IC1001	PS2501-1-X	IC, LINEAR	
IC1001	0N3131-S.KT	IC, LINEAR	
IC1002	TA76431AS	IC, LINEAR	
IC1002	TA76431ASTP6	IC, LINEAR	
IC3001	NN13400A	IC, LINEAR	
IC3101	MN3885S	IC, CCD	E.S.D.
IC4201	AN3663FBP-V	IC, LINEAR	
IC6001	MN101D02FPB	IC, 8BIT MICROCONTROLLER	E.S.D.
IC6002	RPI-303	PHOTO INTERRUPTER	
IC6003	RPI-303	PHOTO INTERRUPTER	
IC6004	PST3147NR	IC, CMOS STANDARD LOGIC	E.S.D.
IC6004	XC61CC4702MR	IC, CMOS STANDARD LOGIC	E.S.D.
IC6005	KS24C011CS	IC, 1K EEP ROM	E.S.D.
IC6005	AT24C01A10SI	IC, 1K EEP ROM	E.S.D.
IC6005	BR24C01AF-E2	IC, 1K EEP ROM	E.S.D.
IC6005	BR24C01AFWE2	IC, 1K EEP ROM	E.S.D.
IC6005	KS24C011IS	IC, 1K EEP ROM	E.S.D.
IC6005	M24C01-MN6	IC, 1K EEP ROM	E.S.D.
IC6301	PT6957E	IC, LOGIC ( G,H,J,K,M,N )	E.S.D.

## TRANSISTORS

Ref. No.	Part No.	Part Name & Description	Remarks
Q1001	2SC4533LP.KT	TRANSISTOR SI NPN	
Q1001	2SC5130LF608	TRANSISTOR SI NPN	
Q1002	2SD1458	TRANSISTOR SI NPN	
Q1002	2SD2259	TRANSISTOR SI NPN	
Q1051	2SD2159(T)	TRANSISTOR SI NPN	
Q1051	2SD1581(T)	TRANSISTOR SI NPN	
Q1052	2SD601A(RS)	TRANSISTOR SI NPN CHIP	
Q1052	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q1053	2SD235800A	TRANSISTOR SI NPN CHIP	
Q1053	2SD2097TV2R	TRANSISTOR SI NPN CHIP	
Q3001	2SB709A	TRANSISTOR SI PNP CHIP	
Q3001	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q3002	2SB709A(RS)	TRANSISTOR SI PNP CHIP	
Q3002	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q3003	2SD601A(RS)	TRANSISTOR SI NPN CHIP	
Q3003	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q4001	2SB1218ARS	TRANSISTOR SI PNP CHIP	
Q4001	2SA1576A106R	TRANSISTOR SI PNP CHIP	
Q4002	2SD1819ARS	TRANSISTOR SI NPN CHIP	
Q4003	2SD1819ARS	TRANSISTOR SI NPN CHIP	
Q4101	2SD601A(RS)	TRANSISTOR SI NPN CHIP	
Q4101	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q6001	2SD1819ARS	TRANSISTOR SI NPN CHIP	
Q6001	2SC4081T106R	TRANSISTOR SI NPN CHIP	
Q6002	2SB709A(RS)	TRANSISTOR SI PNP CHIP	
Q6002	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q6003	2SD1819ARS	TRANSISTOR SI NPN CHIP	
Q6003	2SC4081T106R	TRANSISTOR SI NPN CHIP	
Q6005	2SB709A(RS)	TRANSISTOR SI PNP CHIP	
Q6005	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q6006	2SD1819ARS	TRANSISTOR SI NPN CHIP	







Ref. No.	Part No.	Part Name & Description	Remarks
Q6006	2SC4081T106R	TRANSISTOR SI NPN CHIP	
Q6009	VEKS5707	PHOTO SENSOR UNIT	
Q6010	VEKS5707	PHOTO SENSOR UNIT	
Q6301	IMT17-T110	TRANSISTOR COMPLX CMP SI PNP CHIP ( G,H,J,K,M,N )	
Q6302	IMT17-T110	TRANSISTOR COMPLX CMP SI PNP CHIP ( G,H,J,K,M,N )	
Q6303	2SB709A	TRANSISTOR SI PNP CHIP ( G,H,J,K,M,N )	
Q6303	2SA1037K146R	TRANSISTOR SI PNP CHIP ( G,H,J,K,M,N )	
Q6502	2SD601A	TRANSISTOR SI NPN CHIP ( L )	
Q6502	2SC2412K146R	TRANSISTOR SI NPN CHIP ( L )	
Q6503	2SD601A	TRANSISTOR SI NPN CHIP ( L )	
Q6503	2SC2412K146R	TRANSISTOR SI NPN CHIP ( L )	
Q6504	2SD601A	TRANSISTOR SI NPN CHIP ( L )	
Q6504	2SC2412K146R	TRANSISTOR SI NPN CHIP ( L )	
Q6505	2SD601A	TRANSISTOR SI NPN CHIP ( L )	
Q6505	2SC2412K146R	TRANSISTOR SI NPN CHIP ( L )	
Q6508	2SB709A	TRANSISTOR SI PNP CHIP ( L )	
Q6508	2SA1037K146R	TRANSISTOR SI PNP CHIP ( L )	
Q6509	2SD601A	TRANSISTOR SI NPN CHIP ( L )	
Q6509	2SC2412K146R	TRANSISTOR SI NPN CHIP ( L )	
Q6510	2SD601A	TRANSISTOR SI NPN CHIP ( L )	
Q6510	2SC2412K146R	TRANSISTOR SI NPN CHIP ( L )	

## DIODES

Ref. No.	Part No.	Part Name & Description	Remarks
D1001	DB105G	DIODE SI	
D1001	S1NB60-4101	DIODE SI	
D1002	ERA18-04	DIODE SI	
D1002	EG01	DIODE SI	
D1003	ERA18-04	DIODE SI	
D1003	EG01	DIODE SI	
D1005	ERA18-04	DIODE SI	
D1005	EG01	DIODE SI	
D1006	ERB32-01L3	DIODE SI	
D1006	RGP15GL-5088	DIODE SI	
D1006	RU2YXLC1	DIODE SI	
D1008	EC21QS03L-TE	DIODE SI	
D1008	D1FM3	DIODE SI	
D1008	SFPJ-63	DIODE SI	
D1008	U2FWJ44M	DIODE SI	
D1009	D1FS4	DIODE SI	
D1009	EC10QS03L	DIODE SI	
D1009	EP10QY03	DIODE SI	
D1009	SFPJ-53	DIODE SI	
D1009	U1FWJ44N	DIODE SI	
D1015	MA2180LA	DIODE ZENER 18V	
D1015	1N4746A-T	DIODE ZENER 18V	
D1015	1N4746ARL	DIODE ZENER 18V	
D1016	MA165	DIODE SI	
D1016	1SS119	DIODE SI	
D1016	1SS133T	DIODE SI	
D1051	MA4110N-H	DIODE ZENER 11V	
D3006	MA4051-M	DIODE ZENER 5.1V ( H,J,M,N )	
D3006	04AZ5.1ZTPA7	DIODE ZENER 5.1V ( H,J,M,N )	
D3007	MA4051-M	DIODE ZENER 5.1V ( H,J,M,N )	

Ref. No.	Part No.	Part Name & Description	Remarks
D3007	04AZ5.1ZTPA7	DIODE ZENER 5.1V ( H,J,M,N )	
D4209	MA165	DIODE SI	
D4209	1SS119	DIODE SI	
D4209	1SS133T	DIODE SI	
D6001	VEKS5708	SENSOR LED UNIT	
D6003	MA165	DIODE SI	
D6003	1SS119	DIODE SI	
D6003	1SS133T	DIODE SI	
D6325	MA165	DIODE SI	
D6325	1SS119	DIODE SI	
D6325	1SS133T	DIODE SI	
D6326	MA165	DIODE SI	
D6326	1SS119	DIODE SI	
D6326	1SS133T	DIODE SI	

## RESISTORS

Ref. No.	Part No.	Part Name & Description	Remarks
R1001	VRESC2TK275	CARBON 1/2W 2.7M	
R1001	VRESC2TK275C	CARBON 1/2W 2.7M	
R1001	VRESC2TK275T	CARBON 1/2W 2.7M	
R1003	VRESE2TJ334	CARBON 1/2W 330K	
R1004	ERG2SJ333H	METAL OXIDE 2W 33K	
R1005	ERG1SJ560P	METAL OXIDE 1W 56	
R1006	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R1007	ERDS2TJ101	CARBON 1/4W 100	
R1008	ERDS2TJ392	CARBON 1/4W 3.9K	
R1010	ERD25FJ100P	CARBON 1/4W 10	
R1010	ERD25FPJ100P	CARBON 1/4W 10	
R1010	VRESF4FJ100P	CARBON 1/4W 10	
R1014	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R1015	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R1016	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R1017	VRJSD6D2431V	MGF CHIP 1/10W 2.43K	
R1018	VRJSD6D2201V	MGF CHIP 1/10W 2.2K	
R1019	ERDS2T0	CARBON 1/4W 0	
R1025	ERDS2TJ300	CARBON 1/4W 30	
R1026	ERDS2TJ300	CARBON 1/4W 30	
R1051	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R1052	ERDS2TJ153	CARBON 1/4W 15K	
R1053	ERDS2TJ153	CARBON 1/4W 15K	
R1057	ERDS2TJ331	CARBON 1/4W 330	
R1058	ERDS2TJ104	CARBON 1/4W 100K	
R3001	ERJ6GEYJ750V	MGF CHIP 1/10W 75 ( H,J,M,N )	
R3002	ERDS2TJ561	CARBON 1/4W 560	
R3003	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R3004	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3006	ERDS2TJ152	CARBON 1/4W 1.5K	
R3007	ERDS2TJ152	CARBON 1/4W 1.5K	
R3008	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R3009	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R3022	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R3023	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R3027	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R3029	ERJ6GEYJ125V	MGF CHIP 1/10W 1.2M	
















Ref. No.	Part No.	Part Name & Description	Remarks
R3031	ERJ6GEYJ474V	MGF CHIP 1/10W 470K	
R3033	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R3034	ERJ6GEYJ121V	MGF CHIP 1/10W 120	
R3035	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R3036	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R3041	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3053	ERJ6GEYJ684V	MGF CHIP 1/10W 680K	
R3301	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R3302	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R3305	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R4001	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4002	ERJ6GEYJ334V	MGF CHIP 1/10W 330K	
R4003	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R4004	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4005	ERJ6GEYJ225V	MGF CHIP 1/10W 2.2M	
R4006	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R4007	ERJ6GEYJ821V	MGF CHIP 1/10W 820	
R4008	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R4010	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4011	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R4012	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R4014	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R4015	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R4017	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R4028	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R4102	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4103	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R4201	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R4202	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R4203	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K	
R4204	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K	
R4205	ERJ6GEYJ473V	MGF CHIP 1/10W 47K ( H,J,M,N )	
R4206	ERJ6GEYJ473V	MGF CHIP 1/10W 47K ( H,J,M,N )	
R4207	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K ( H,J,M,N )	
R4208	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K ( H,J,M,N )	
R4209	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R4210	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R4213	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4214	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4218	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R4223	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4224	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4225	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4226	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R4228	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4453	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4455	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R6001	ERDS2TJ101	CARBON 1/4W 100	
R6003	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R6006	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6007	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K	
R6010	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R6012	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6016	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6019	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6022	ERJ6GEYJ273V	MGF CHIP 1/10W 27K	
R6024	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	

\_\_\_\_\_

Ref. No.	Part No.	Part Name & Description	Remarks
R6025	ERJ6GEYJ332V	MGF CHIP 1/10W 3.3K	
R6026	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6027	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R6028	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6029	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R6030	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6033	ERDS2TJ681	CARBON 1/4W 680	
R6037	ERJ6GEYJ391V	MGF CHIP 1/10W 390	
R6052	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6057	ERJ6GEYJ102V	MGF CHIP 1/10W 1K ( G,H,J,K,M,N )	
R6059	ERJ6GEYJ102V	MGF CHIP 1/10W 1K ( G,H,J,K,M,N )	
R6060	ERJ6GEYJ105V	MGF CHIP 1/10W 1M	
R6062	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6063	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6064	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6066	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6069	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6070	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6071	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6072	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6073	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6074	ERDS2TJ272	CARBON 1/4W 2.7K	
R6078	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6079	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6080	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6081	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6082	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6085	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6086	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6087	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6089	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6109	ERJ6GEYJ183V	MGF CHIP 1/10W 18K	
R6110	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6115	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6116	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6202	ERJ6GEYJ274V	MGF CHIP 1/10W 270K	
R6203	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6204	ERJ6GEYJ184V	MGF CHIP 1/10W 180K	
R6205	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6224	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6228	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R6231	ERJ6GEYJ225V	MGF CHIP 1/10W 2.2M	
R6346	ERDS2TJ470	CARBON 1/4W 47	
R6364	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6365	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6366	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6367	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6368	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6369	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6370	ERJ6GEYJ121V	MGF CHIP 1/10W 120 ( G,H,J,K,M,N )	
R6371	ERJ6GEYJ223V	MGF CHIP 1/10W 22K ( G,H,J,K,M,N )	
R6373	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K ( G,H,J,K,M,N )	
R6374	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K ( G,H,J,K,M,N )	
R6375	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K ( G,H,J,K,M,N )	
R6376	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K ( G,H,J,K,M,N )	
R6377	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K ( G,H,J,K,M,N )	
R6378	ERJ6GEYJ102V	MGF CHIP 1/10W 1K ( G,H,J,K,M,N )	

Ref. No.	Part No.	Part Name & Description	Remarks
R6379	ERDS2TJ102	CARBON 1/4W 1K ( G,H,J,K,M,N )	
R6380	ERDS2TJ102	CARBON 1/4W 1K ( G,H,J,K,M,N )	
R6381	ERDS2TJ102	CARBON 1/4W 1K ( G,H,J,K,M,N )	
R6382	ERDS2TJ102	CARBON 1/4W 1K ( G,H,J,K,M,N )	
R6502	ERDS2TJ221	CARBON 1/4W 220 ( L )	
R6503	ERDS2TJ221	CARBON 1/4W 220 ( L )	
R6504	ERDS2TJ221	CARBON 1/4W 220 ( L )	
R6505	ERDS2TJ331	CARBON 1/4W 330 ( L )	
R6508	ERDS2TJ331	CARBON 1/4W 330 ( L )	
R6509	ERDS2TJ270	CARBON 1/4W 270 ( L )	
R6510	ERDS2TJ331	CARBON 1/4W 330 ( L )	
R6512	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( L )	
R6513	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( L )	
R6514	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( L )	
R6515	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( L )	
R6518	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( L )	
R6519	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( L )	
R6520	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( L )	
R6521	ERJ6GEYJ103V	MGF CHIP 1/10W 10K ( G,H,J,K,M,N )	

## CAPACITORS

Ref. No.	Part No.	Part Name & Description	Remarks
C1001	ECKATS103MF	CERAMIC 250V 0.01UF	
C1002	ECKATS332ME8	CERAMIC 250V 3300PF	
C1002	ECKDNB332ME8	CERAMIC 125V 3300PF	
C1002	ECKETS332ME8	CERAMIC 125V 3300PF	
C1002	VCKST3G332MX	CERAMIC 250V 3300PF	
C1002	VCKSU3D332MX	CERAMIC 125V 3300PF	
C1003	ECKATS332ME8	CERAMIC 250V 3300PF	
C1003	ECKDNB332ME8	CERAMIC 125V 3300PF	
C1003	ECKETS332ME8	CERAMIC 125V 3300PF	
C1003	VCKST3G332MX	CERAMIC 250V 3300PF	
C1003	VCKSU3D332MX	CERAMIC 125V 3300PF	
C1004	ECEA2DU820YE	ELECTROLYTIC 200V 82UF	
C1004	VCESAN2D820E	ELECTROLYTIC 200V 82UF	
C1004	VCESR2D820XE	ELECTROLYTIC 200V 82UF	
C1005	ECA2DHG4R7B	ELECTROLYTIC 200V 4.7UF	
C1006	ECKR2H221KB5	CERAMIC 500V 220PF	
C1007	ECUV1C224KBN	C CHIP 16V 0.22UF	
C1009	VCYSBRE183KX	CERAMIC 25V 0.018UF	
C1010	ECUV1H101JCN	C CHIP 50V 100PF	
C1011	ECA1HHG4R7I	ELECTROLYTIC 50V 4.7UF	
C1012	ECEA1PEE331	ELECTROLYTIC 18V 330UF	
C1013	ECA1EM331B	ELECTROLYTIC 25V 330UF	
C1016	ECEA1PEE331	ELECTROLYTIC 18V 330UF	
C1017	ECA0JM102B	ELECTROLYTIC 6.3V 1000UF	
C1018	ECUV1E104KBN	C CHIP 25V 0.1UF	
C1019	ECEA0JEE101	ELECTROLYTIC 6.3V 100UF	
C1027	ECKATS103MF	CERAMIC 250V 0.01UF	
C1029	ECUV1H101JCN	C CHIP 50V 100PF	






Ref. No.	Part No.	Part Name & Description	Remarks
C1030	VCYSBRE183KX	CERAMIC 25V 0.018UF	
C1032	ECEA0JKA221	ELECTROLYTIC 6.3V 220UF	
C1051	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C1052	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C1058	ECEA0JEE101	ELECTROLYTIC 6.3V 100UF	
C1059	ECEA1CKA470	ELECTROLYTIC 16V 47UF	
C3001	ECA0JM471	ELECTROLYTIC 6.3V 470UF	
C3003	ECEA1CKA470	ELECTROLYTIC 16V 47UF	
C3004	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3014	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3015	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3017	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3018	ECUV1H181JCN	C CHIP 50V 180PF	
C3019	ECUV1H560JCN	C CHIP 50V 56PF	
C3021	ECUV1C224ZFN	C CHIP 16V 0.22UF	
C3022	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3023	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3024	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3025	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3026	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3027	ECUV1C224ZFN	C CHIP 16V 0.22UF	
C3028	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3029	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3030	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3031	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3032	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3033	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3034	ECUV1C224ZFN	C CHIP 16V 0.22UF	
C3035	ECUV1H560JCN	C CHIP 50V 56PF	
C3036	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3037	ECEA10JKA220	ELECTROLYTIC 6.3V 22UF	
C3038	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF ( H,J,M,N )	
C3039	ECUV1H822KBN	C CHIP 50V 8200PF	
C3043	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3044	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3045	ECUV1C474ZFN	C CHIP 16V 0.47UF	
C3047	ECUV1H181JCN	C CHIP 50V 180PF	
C3048	ECUV1H560JCN	C CHIP 50V 56PF	
C3049	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3050	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3051	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3052	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3053	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3054	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3055	ECUV1H392KBN	C CHIP 50V 3900PF	
C3056	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3062	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3101	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3102	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3104	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3105	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3106	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3108	ECUV1H102KBN	C CHIP 50V 1000PF	
C3109	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3302	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3303	ECUV1H121JCN	C CHIP 50V 120PF	
C3306	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	



Ref. No.	Part No.	Part Name & Description	Remarks
C3308	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3501	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3502	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3503	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3504	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3505	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3506	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3507	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3508	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3513	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3514	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3515	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3516	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3517	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3518	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3519	ECUV1H102KBN	C CHIP 50V 1000PF	
C4001	ECUV1C224ZFN	C CHIP 16V 0.22UF	
C4002	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4003	ECUV1H272KBN	C CHIP 50V 2700PF	
C4004	ECUV1H103KBN	C CHIP 50V 0.01UF	
C4005	ECEA10JKA220	ELECTROLYTIC 6.3V 22UF	
C4006	ECUV1H102KBN	C CHIP 50V 1000PF	
C4007	ECEA10JKA220	ELECTROLYTIC 6.3V 22UF	
C4008	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C4009	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4010	ECUV1E273KBN	C CHIP 25V 0.027UF	
C4011	ECUV1H822KBN	C CHIP 50V 8200PF	
C4012	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4013	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4014	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4017	ECUV1H103KBN	C CHIP 50V 0.01UF	
C4102	ECQB1562JF	POLYESTER 100V 5600PF	
C4103	ECUV1H103KBN	C CHIP 50V 0.01UF	
C4104	ECUV1H103KBN	C CHIP 50V 0.01UF	
C4106	ECEA1CKA220	ELECTROLYTIC 16V 22UF	
C4201	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C4202	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C4203	ECEA0JKA330	ELECTROLYTIC 6.3V 33UF	
C4204	ECEA0JKA330	ELECTROLYTIC 6.3V 33UF	
C4205	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4206	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4207	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4208	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4209	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4210	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4211	ECUV1H153KBN	C CHIP 50V 0.015UF	
C4212	ECUV1H153KBN	C CHIP 50V 0.015UF	
C4213	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4214	ECEA1CKA101	ELECTROLYTIC 16V 100UF	
C4216	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4217	ECEA10JKA220	ELECTROLYTIC 6.3V 22UF	
C4218	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4219	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4227	ECUV1C224ZFN	C CHIP 16V 0.22UF	
C4229	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C4230	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C4451	ECUV1H103KBN	C CHIP 50V 0.01UF	

Ref. No.	Part No.	Part Name & Description	Remarks
C4452	ECUV1H103KBN	C CHIP 50V 0.01UF	
C4455	ECUV1E104KBN	C CHIP 25V 0.1UF	
C4456	ECUV1E104KBN	C CHIP 25V 0.1UF	
C4459	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C4901	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4902	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C4903	ECEA1HKA3R3	ELECTROLYTIC 50V 3.3UF	
C4904	ECEA1HKA3R3	ELECTROLYTIC 50V 3.3UF	
C4905	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4906	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4911	ECUV1E223KBN	C CHIP 25V 0.022UF	
C4912	ECUV1E104KBN	C CHIP 25V 0.1UF	
C4913	ECUV1H103KBN	C CHIP 50V 0.01UF	
C4917	ECUV1E104KBN	C CHIP 25V 0.1UF	
C4918	ECUV1E104KBN	C CHIP 25V 0.1UF	
C4919	ECUV1E104KBN	C CHIP 25V 0.1UF	
C4920	ECUV1E223KBN	C CHIP 25V 0.022UF	
C6001	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6003	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6005	ECUV1H150JCN	C CHIP 50V 15PF	
C6006	ECUV1H100CCN	C CHIP 50V 10PF	
C6019	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C6021	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C6026	ECUV1H102KBN	C CHIP 50V 1000PF	
C6027	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6033	ECUV1H104ZFN	C CHIP 50V 0.1UF	
C6201	ECUV1H332KBN	C CHIP 50V 3300PF	
C6203	ECUV1H103KBN	C CHIP 50V 0.01UF	
C6204	ECUV1H103KBN	C CHIP 50V 0.01UF	
C6208	ECUV1C104KBN	C CHIP 16V 0.1UF	
C6214	ECUV1H102KBN	C CHIP 50V 1000PF	
C6217	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6218	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C6221	ECEA10JKA220	ELECTROLYTIC 6.3V 22UF	
C6223	ECUV1H103KBN	C CHIP 50V 0.01UF	
C6224	VCESAM0J331	ELECTROLYTIC 6.3V 330UF	
C6228	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6231	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C6305	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C6306	ECEA0JKA331	ELECTROLYTIC 6.3V 330UF ( G,H,J,K,M,N )	
C6307	ECUV1E104ZFN	C CHIP 25V 0.1UF ( G,H,J,K,M,N )	
C6320	VCESAM0J331	ELECTROLYTIC 6.3V 330UF	
C6321	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C7001	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C7010	ECUV1H102KBN	C CHIP 50V 1000PF	

## COILS

Ref. No.	Part No.	Part Name & Description	Remarks
L1001	ELF15N005A	LINE FILTER 0.5A 18MH	
L1001	LSLQ0287	LINE FILTER 0.5A 18MH	
L1001	VLQS0166	LINE FILTER 0.5A 18MH	
L1001	VLQS0167	LINE FILTER 0.5A 18MH	
L1001	VLQS0170	LINE FILTER 0.6A 18MH	
L1002	VLQSAB7D220K	COIL 22UH	
L1003	VLQSAB7D100K	COIL 10UH	
L1006	VLPS0083	FILTER	
L3001	ELESN470KA	COIL 47UH	
L3014	VLQSH02R390K	COIL 39UH	
L3016	ELESN330KA	COIL 33UH	
L3018	ELESN470KA	COIL 47UH	
L3101	ELESN101KA	COIL 100UH	
L3505	ELESN101KA	COIL 100UH	
L3506	ELESN101KA	COIL 100UH	
L3507	ELESN101KA	COIL 100UH	
L4001	ELELN153KA	COIL 15MH	
L4002	ELESN101KA	COIL 100UH	
L4101	ELESN471KA	COIL 470UH	
L4201	ELESN101KA	COIL 100UH	
L4451	ELESN101KA	COIL 100UH	
L6002	ELEXT101KE04	COIL 100UH	
L6301	ELESN101KA	COIL 100UH ( G,H,J,K,M,N )	
L6302	ELESN470KA	COIL 47UH	
L6303	ERDS2TJ3R3	CARBON 1/4W 3.3	
L7003	VLQSH02R101K	COIL 100UH	

### CRYSTAL OSCILLATOR

Ref. No.	Part No.	Part Name & Description	Remarks
X3010	VSXS0195	CRYSTAL OSCILLATOR	
X6001	VSXS0232-TB	CRYSTAL OSCILLATOR	










### PIN HEADERS

Ref. No.	Part No.	Part Name & Description	Remarks
P3501	LSJWM9N050LL	CONNECTOR CABLE W/PLUG,5V	
P3502	LSEK0407	SHIELD PLATE UNIT	
P4001	VJSS0888	FE CONNECTOR 2P	
P4002	LSJWM6N130LL	CONNECTOR CABLE W/PLUG,65VP-P	
P6201	LSJP0089	CONNECTOR 12P	
P6202	LSJS02KF005	CONNECTOR 5P	





### SWITCHES

Ref. No.	Part No.	Part Name & Description	Remarks
SW6001	LSSH0002	LEAF SWITCH-SAFETY TAB	
SW6002	LSSS0012	MODE SELECT SWITCH	
SW6301	EVQ11A09K	PUSH SWITCH	
SW6302	EVQ11A09K	PUSH SWITCH ( L )	
SW6303	EVQ11A09K	PUSH SWITCH ( G,H,J,K,M,N )	
SW6304	EVQ11A09K	PUSH SWITCH ( L )	
SW6306	EVQ11A09K	PUSH SWITCH ( G,H,J,K,M,N )	
SW6307	EVQ11A09K	PUSH SWITCH ( G,H,J,K,L )	
SW6308	EVQ11A09K	PUSH SWITCH ( L,M,N )	
SW6309	EVQ11A09K	PUSH SWITCH	
SW6310	EVQ11A09K	PUSH SWITCH	
SW6311	EVQ11A09K	PUSH SWITCH ( L )	
SW6312	EVQ11A09K	PUSH SWITCH ( L )	
SW6313	EVQ11A09K	PUSH SWITCH ( G,H,J,K )	
SW6314	EVQ11A09K	PUSH SWITCH ( G,H,J,K,M,N )	
SW6315	EVQ11A09K	PUSH SWITCH ( G,H,J,K,M,N )	
SW6316	EVQ11A09K	PUSH SWITCH ( M,N )	

### FUSE & PROTECTOR

Ref. No.	Part No.	Part Name & Description	Remarks
F1001	VSFS0003A16	FUSE 125V 1.6A	
F1001	VSFS0032B16	FUSE 125V 1.6A	
F1001	XBA1C16NU100	FUSE 125V 1.6A	
PR1001	UNH000600A	IC PROTECTOR 1.5A	
PR1001	ICP-N38-TP1	IC PROTECTOR 1.5A	
PR1001	LSSF009A25E	IC PROTECTOR 1.5A	
PR1002	UNH000600A	IC PROTECTOR 1.5A	
PR1002	ICP-N38-TP1	IC PROTECTOR 1.5A	
PR1002	LSSF009A25E	IC PROTECTOR 1.5A	





### TRANSFORMER

Ref. No.	Part No.	Part Name & Description	Remarks
T1001	VTPS0042-1	SW TRANSFORMER	
T1001	ETS28AD2J3NC	SW TRANSFORMER ( G,H,J,K,L,M )	
T1001	LSTP0105	SW TRANSFORMER ( G,H,J,K,L,M )	
T1001	VTPS0041-1	SW TRANSFORMER ( G,H,J,K,L,M )	
T4101	LSLT0051	TRANSFORMER	

### JACKS

Ref. No.	Part No.	Part Name & Description	Remarks
JK3001	LSJH0055	Hi-Fi AUDIO/VIDEO JACK SOCKET	
JK3002	LSJH0057	AUDIO/VIDEO JACK SOCKET ( H,J,M,N )	

### MISCELLANEOUS

Ref. No.	Part No.	Part Name & Description	Remarks
711	LSSZ0004	INFRARED RECEIVER UNIT	
716	LSSZ0001	LED DISPLAY PANEL ( G,H,J,K,M,N )	
716	LSSZ0002	LED DISPLAY PANEL ( L )	
718	LSJW0023	FLEXIBLE FLAT CABLE W/OUT PLUG,	
741	LSJA0360	AC CORD W/PLUG,AC 120V	
741	LSJA0358	AC CORD W/PLUG,AC 120V	
741	LSJA0359	AC CORD W/PLUG,AC 120V	
741	LSJA0361	AC CORD W/PLUG,AC 120V	
743	ENG56717G1	TUNER,UHF/VHF NR	E.S.D.
771	EYF52BC	FUSE HOLDER	

### 12.3.3. CAPSTAN STATOR C.B.A. NR

#### INTEGRATED CIRCUITS

Ref. No.	Part No.	Part Name & Description	Remarks
IC2501	AN3846SC	IC, LINEAR	

#### RESISTORS

Ref. No.	Part No.	Part Name & Description	Remarks
R2501	ERJ8GEYJ1R0Z	MGF CHIP 1/8W 1	
R2502	ERJ8GEYJ1R0Z	MGF CHIP 1/8W 1	
R2505	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	

#### CAPACITORS

Ref. No.	Part No.	Part Name & Description	Remarks
C2504	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C2506	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C2507	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C2508	ECUV1E104KBN	C CHIP 25V 0.1UF	
C2509	ECUV1E104KBN	C CHIP 25V 0.1UF	
C2510	ECUV1E104KBN	C CHIP 25V 0.1UF	
C2511	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C2517	ECUV1E104KBN	C CHIP 25V 0.1UF	
C2519	ECUV1H102KBN	C CHIP 50V 1000PF	
C2520	ECUV1C225ZFN	C CHIP 16V 2.2UF	
C2521	ECUV1C225ZFN	C CHIP 16V 2.2UF	
C2522	ECUV1C225ZFN	C CHIP 16V 2.2UF	

#### MISCELLANEOUS

Ref. No.	Part No.	Part Name & Description	Remarks
491	XYN2+J7	SCREW W/WASHER,STEEL	
731(IC2505)	EZMPS300F12	MR HEAD	
732(P2502)	LSJS0097	CONNEXOR 12P	
733	LSMA0384	BACK PLATE,STEEL	

NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.

MAIN C.B.A. (POWER SUPPLY/VIDEO/AUDIO SECTION)

MODE PIN NO.	STOP	MODE PIN NO.	STOP	MODE PIN NO.	STOP	MODE PIN NO.	STOP	MODE PIN NO.	STOP	MODE PIN NO.	STOP
IC1001		46	5.0	IC3101		46	3.7	B	0	TP4208	0.4
1	5.2	47	5.0	1	2.8	47	1.8	Q4101			
2	4.2	48	0	2	5.1	48	2.3	E	0		
3	1.4	49	0	3	0	49	3.6	C	0		
4	1.4	50	0.4	4	2.9	50	3.5	B	0		
IC1002		51	0	5	3.0	51	5.1				
1	2.5	52	1.6	6	-4.6	52	3.5	TP1001	0		
2	0	53	2.0	7	2.2	53	5.9	TP1002	33.0		
3	4.2	54	2.1	8	3.5	54	2.4	TP1003	15.0		
IC3001		55	2.1	IC4201		55	0	TP1005	5.3		
1	5.0	56	2.2	1	0	56	0.4	TP1006	5.6		
2	2.0	57	2.2	2	0	57	5.9	TP1007	0		
3	2.3	58	2.3	3	1.9	58	12.0	TP1009	0		
4	2.5	59	2.2	4	0	59	6.0	TP1050	5.2		
5	2.1	60	0	5	2.5	60	0.8	TP1058	12.0		
6	2.7	61	3.2	6	2.5	61	2.6	TP1080	0.1		
7	2.0	62	3.0	7	2.1	62	2.5	TP1081	15.0		
8	0	63	3.0	8	0.4	63	2.8	TP3001	2.8		
9	1.9	64	5.1	9	0.1	64	0.6	TP3002	2.8		
10	1.8	65	2.7	10	0.4			TP3003	2.0		
11	2.0	66	3.0	11	0.1	Q1001		TP3004	4.3		
12	2.2	67	2.6	12	2.1	E	0.3	TP3005	0.1		
13	2.0	68	2.6	13	2.7	C	0	TP3006	2.5		
14	2.8	69	2.6	14	0.1	B	134.4	TP3007	2.0		
15	2.0	70	0	15	0.4	Q1002		TP3008	3.4		
16	2.4	71	0	16	2.4	E	0	TP3009	0		
17	0.1	72	3.1	17	0.8	C	0.3	TP3010	5.1		
18	4.5	73	0	18	2.6	B	0.6	TP3011	0.4		
19	2.5	74	3.0	19	0.1	Q1051		TP3101	2.9		
20	3.5	75	3.0	20	0	E	12.0	TP3102	3.0		
21	2.8	76	2.0	21	0	C	15.0	TP3103	1.9		
22	0	77	2.5	22	0	B	12.5	TP3150	4.1		
23	3.4	78	2.8	23	0	Q1052		TP3151	2.3		
24	2.6	79	2.6	24	2.2	E	0.7	TP3152	2.6		
25	2.6	80	2.8	25	5.1	C	12.5	TP3153	2.6		
26	2.6	81	5.0	26	0.1	B	0	TP3401	0		
27	5.0	82	3.3	27	0.1	Q1053		TP3801	0		
28	0.3	83	0.1	28	3.8	E	5.2	TP3802	5.1		
29	3.8	84	5.0	29	1.6	C	5.3	TP3803	0.1		
30	5.0	85	4.3	30	0.8	B	6.0	TP3804	2.6		
31	1.8	86	---s	31	0.2	Q3001		TP3805	0.1		
32	0	87	4.9	32	2.6	E	2.1	TP3806	0.1		
33	4.8	88	4.8	33	2.6	C	0	TP3807	0.4		
34	---	89	2.3	34	0.8	B	2.8	TP4002	0		
35	1.9	90	2.8	35	2.5	Q4001		TP4011	2.6		
36	5.1	91	0.9	36	0	E	4.4	TP4101	0		
37	2.6	92	2.7	37	1.9	C	5.1	TP4102	0		
38	2.6	93	0	38	0	B	5.1	TP4103	0		
39	0.3	94	0.1	39	0.1	Q4002		TP4201	0		
40	2.6	95	1.8	40	5.0	E	0.8	TP4202	0		
41	0	96	3.0	41	0	C	0	TP4203	0		
42	2.6	97	0.1	42	4.9	B	0	TP4204	0		
43	2.6	98	3.1	43	4.9	Q4003		TP4205	1.6		
44	2.6	99	2.6	44	2.4	E	0.8	TP4206	3.8		
45	2.6	100	3.1	45	5.2	C	0	TP4207	0.8		

NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.

### MAIN C.B.A. (SYSTEM CONTROL/SERVO SECTION)

MODE PIN NO.	REC	PLAY
IC6001		
1	5.2	5.2
2	2.3	0
3	4.7	4.9
4	4.8	4.7
5	4.9	4.9
6	0	0
7	0	0
8	0	0
9	0	0
10	5.1	5.2
11	5.2	5.2
12	0	0
13	5.2	5.2
14	5.2	5.2
15	0	0
16	5.2	5.2
17	4.8	4.8
18	4.8	4.8
19	5.2	5.2
20	5.1	5.1
21	0	0
22	2.3	2.4
23	2.6	2.6
24	0	0
25	5.0	5.0
26	0	0
27	0	2.6
28	5.2	0
29	3.8	3.8
30	0	0
31	5.1	5.1
32	0	0
33	2.4	2.4
34	2.6	2.6
35	5.1	0
36	4.8	5.2
37	2.6	2.7
38	2.5	2.5
39	0	0
40	4.3	4.3
41	4.3	4.3
42	0	0
43	4.3	4.3
44	4.4	4.3
45	4.3	4.3
46	4.4	4.3
47	2.1	2.1
48	0	0
49	2.1	2.1
50	2.7	2.7
51	5.3	5.3
52	2.6	2.6
53	2.6	2.6
54	0	0

MODE PIN NO.	REC	PLAY
55	0	0
56	5.2	5.2
57	0	0
58	4.4	4.4
59	0	0
60	5.1	5.1
61	0	0
62	5.1	0
63	5.2	5.2
64	2.5	2.5
65	2.5	2.5
66	0.3	0.3
67	2.6	2.6
68	2.6	2.6
69	2.6	2.6
70	2.6	2.6
71	0	0
72	2.6	2.6
73	5.2	5.2
74	3.0	0
75	2.2	2.5
76	0	2.6
77	0.2	0.1
78	0	2.9
79	4.3	4.5
80	4.4	4.5
81	0.1	4.8
82	0.4	0.3
83	0	0.1
84	0	0
85	2.5	2.5
86	0.1	0.1
87	5.1	5.1
88	5.3	5.3
89	0.1	5.3
90	5.1	5.1
91	0	5.3
92	0	5.1
93	0.1	5.1
94	5.1	5.1
95	0	0.1
96	5.0	0.1
97	0	0
98	2.6	0.2
99	5.2	0
100	4.4	4.4
IC6002		
1	0	0
2	5.1	4.9
3	1.2	1.2
4	0	0
IC6003		
1	0	0
2	5.1	5.1
3	2.4	2.4





MODE PIN NO.	REC	PLAY
4	1.2	1.2
IC6004		
1		
2		
3		
IC6005		
1	0	0
2	0	0
3	0	0
4	0	0
5	4.8	4.8
6	4.8	4.8
7	0	0
8	5.3	5.3
Q6001		
E	0	0
C	5.2	5.2
B	0	0
Q6002		
E	11.1	12.0
C	11.8	0
B	12.0	12.0
Q6003		
E	5.2	0
C	11.1	12.0
B	4.5	0
Q6005		
E	4.4	4.4
C	5.2	5.2
B	5.3	5.3
Q6006		
E	0.7	0.7
C	0.1	0.1
B	0	0
Q6009		
E	0	0
C	5.0	5.1
Q6010		
E	0	0
C	5.0	5.0
Q6502		
E	0	0
C	7.5	6.3
B	0	0
Q6503		
E	0	0
C	7.6	6.8
B	0	0
Q6504		
E	0	0.8
C	7.7	0.1
B	0	0

MODE PIN NO.	REC	PLAY
Q6505		
E	0.8	0
C	0.1	6.4
B	0	0
Q6508		
E	0.4	0.4
C	0	0
B	1.1	1.1
Q6509		
E	0.8	0.8
C	0	0.1
B	0	0
Q6510		
E	0	0
C	7.6	6.3
B	0	0
TP6001	5.1	5.1
TP6002	5.1	5.1
TP6003	3.5	2.7
TP6004	5.0	5.1
TP6005	4.9	5.0
TP6007	0	0
TP6008	0	0
TP6009	5.3	5.3
TP6010	4.8	4.7
TP6011	4.8	4.8
TP6014	0	0
TP6017	0	0
TP6018	5.2	5.2
TP6019	0	0
TP6020	2.3	2.4
TP6021	5.2	5.2
TP6101	0	0
TP6102	5.1	5.1
TP6103	0.1	0.1
TP6104	2.3	2.3
TP6105	0	0.1
TP6106	5.2	5.2
TP6107	5.0	5.1
TP6201	2.4	2.4
TP6202	2.6	2.6
TP6203	2.6	2.6
TP6204	2.5	2.5
TP6205	2.6	2.6
TP6206	3.0	2.6
TP6207	2.6	2.6
TP6208	2.5	2.5
TP6209	2.5	2.5
TP6210	5.0	5.0
TP6301	0.1	0.1
TP6302	0.1	0.1
TP6303	-1.0	-1.4
TP6304	5.1	5.1
TP6305	-1.2	-1.4

[illegible]

## CAPSTAN STATOR C.B.A.

[illegible]

- Important safety notice**  
Components identified by the sign  have special characteristics important for safety. When replacing any of these components. Use only the specified parts.
- Do not use the part number shown on this drawing for ordering.  
The correct part number and part value is shown in the parts list, and may be slightly different or amended since this drawing was prepared.
- Use only original replacement parts:  
To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.
- Parts different in shape or size may be used.  
However, only interchangeable parts will be supplied as service replacement parts.
- Test point information  
 ① :Test point with a jumper wire across a hole in P.C.B.  
 :Test point with a component lead on the foil side.  
 :Test point with no test pin.  
 :Test point with a test pin.

## Schematic Diagram Notes

- Indication for Zener Voltage of Zener Diodes  
The Zener Voltage of Zener Diodes are indicated as such on Schematic Diagrams.

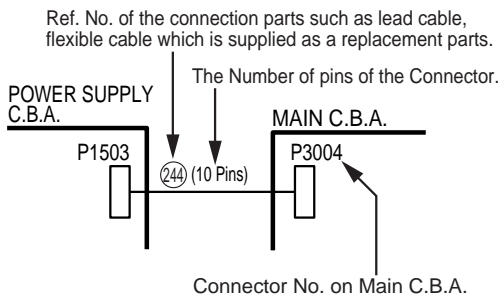
Example:

(6.2V).....Zener Voltage

- How to identify Connectors  
Each connector is labeled with a Connector No. and Pin No. Indicating what it is connected to, in other words, its counter part.  
Use the interconnection schematic diagram to find the connection between associated connectors.

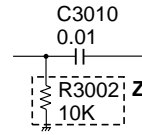
Example:

The connections between C.B.A.s are shown below.



- Parts enclosed in dashed lines marked "Z" are not used in any models included in this service manual.

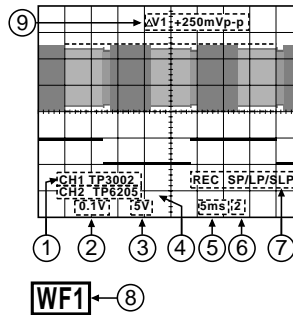
Example:



- The part number shown on this drawing is only main part number, except for safety parts. Be sure to make your orders of replacement parts according to the parts list.

## Signal Waveform Note

How to read Signal Waveform



- Connecting Point
- Volts/Div
- Volts/Div
- Connecting Point
- Time/Div
- Trigger Channel of the scope  
(1:CH1,2:CH2)
- Operation Mode of VCR
- Waveform Point on Schematic
- $\Delta V1$ :Peak to Peak

## Voltage Chart Note

Voltage Measurement

- Color bar signal in SP mode.
- :Unmeasurable or not necessary to measure.

## Circuit Board Layout Note

Circuit Board Layout shows components installed for various models.

For proper parts content for the model you are servicing, please refer to the schematic diagram and parts list.

NOTE:

Circuit Board Layout includes components which are not used.

COMPARISON CHART  
OF MODELS & MARKS

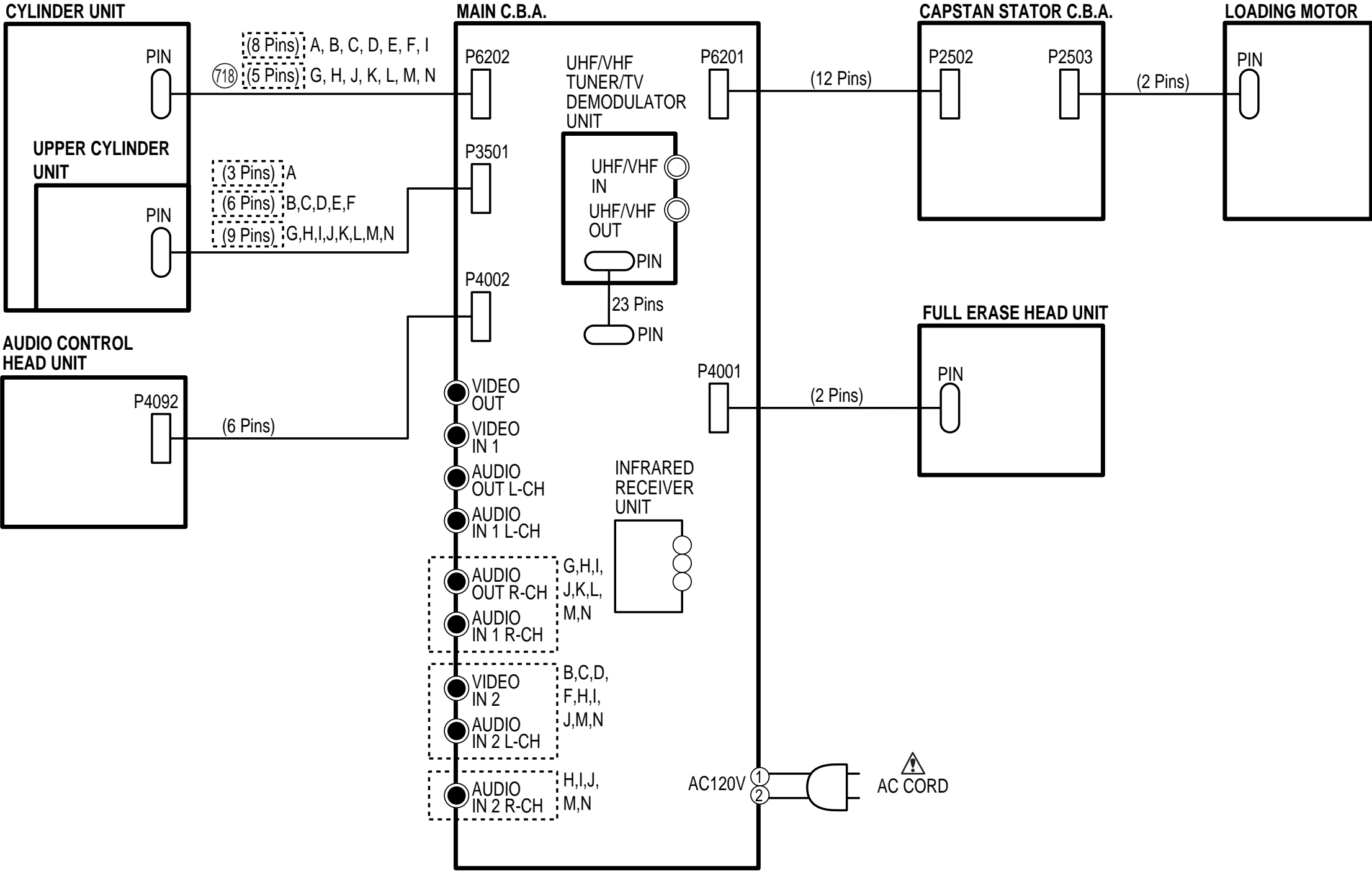
MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N
Not Used	Z

Note : Refer to item 3 of Schematic Diagram Notes for mark "Z".

INTERCONNECTION SCHEMATIC DIAGRAM

NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.

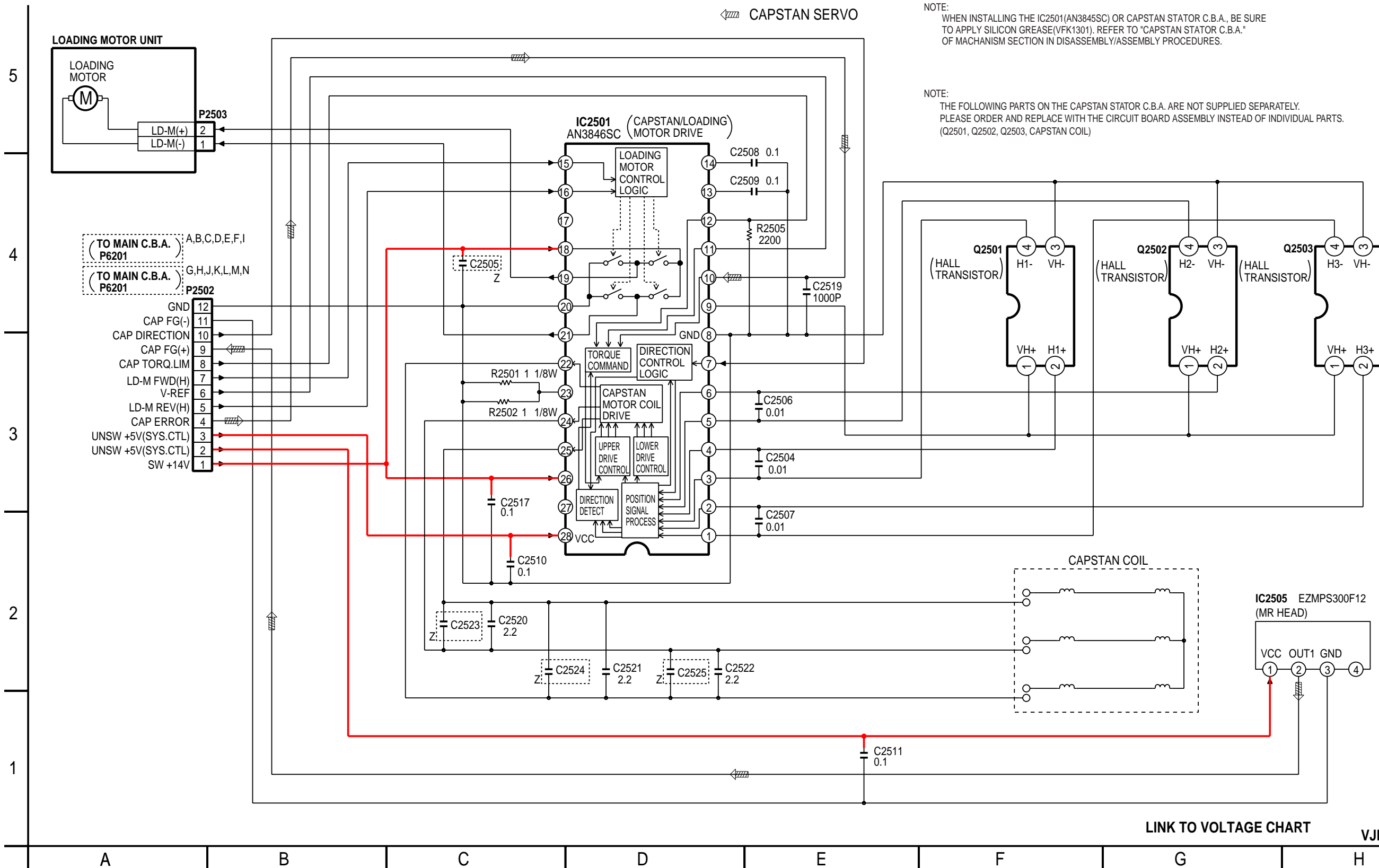
COMPARISON CHART OF MODELS & MARKS	
MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N
Not Used	Z



CAPSTAN STATOR SCHEMATIC DIAGRAM

NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS	
MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N
Not Used	Z

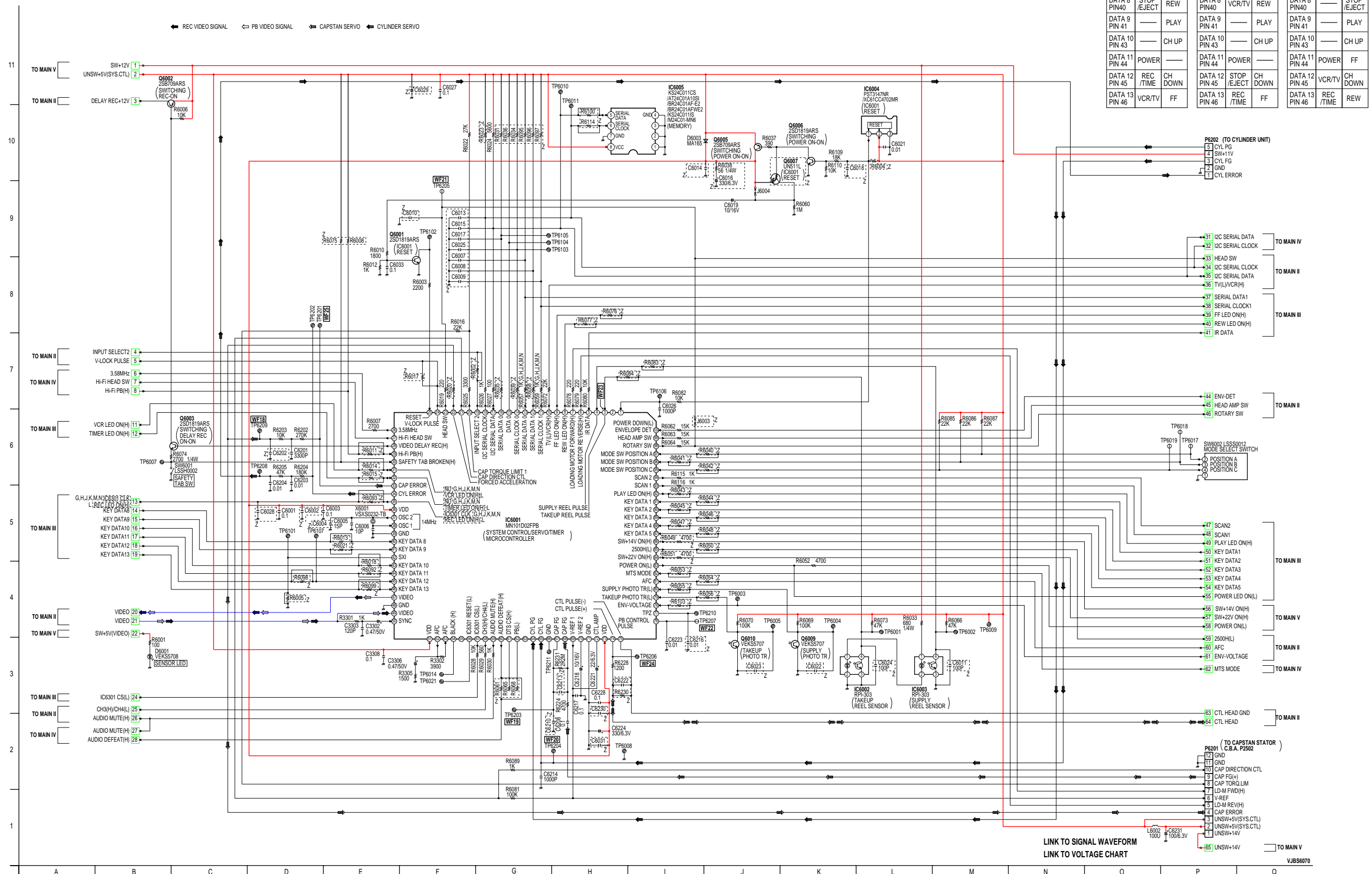


NOTE:  
WHEN INSTALLING THE IC2501(AN3845SC) OR CAPSTAN STATOR C.B.A., BE SURE  
TO APPLY SILICON GREASE(VFK1301). REFER TO "CAPSTAN STATOR C.B.A."  
OF MACHANISM SECTION IN DISASSEMBLY/ASSEMBLY PROCEDURES.

NOTE:  
THE FOLLOWING PARTS ON THE CAPSTAN STATOR C.B.A. ARE NOT SUPPLIED SEPARATELY.  
PLEASE ORDER AND REPLACE WITH THE CIRCUIT BOARD ASSEMBLY INSTEAD OF INDIVIDUAL PARTS.  
(Q2501, Q2502, Q2503, CAPSTAN COIL)

NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS	
MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
	K
VHQ-451	L
PV-V4611	M
-----	N
Not Used	Z



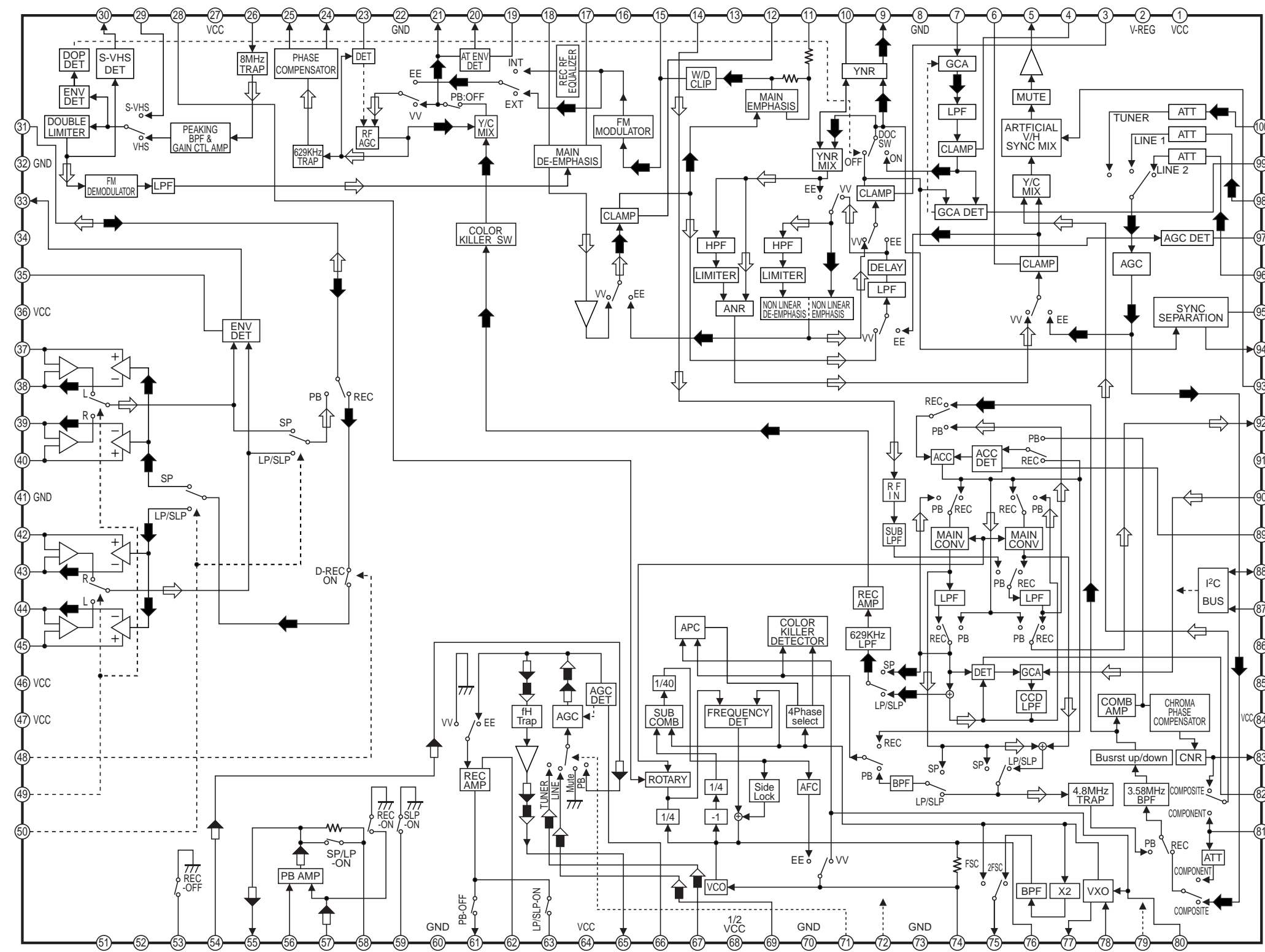
[illegible]

---

VJBS6070

---

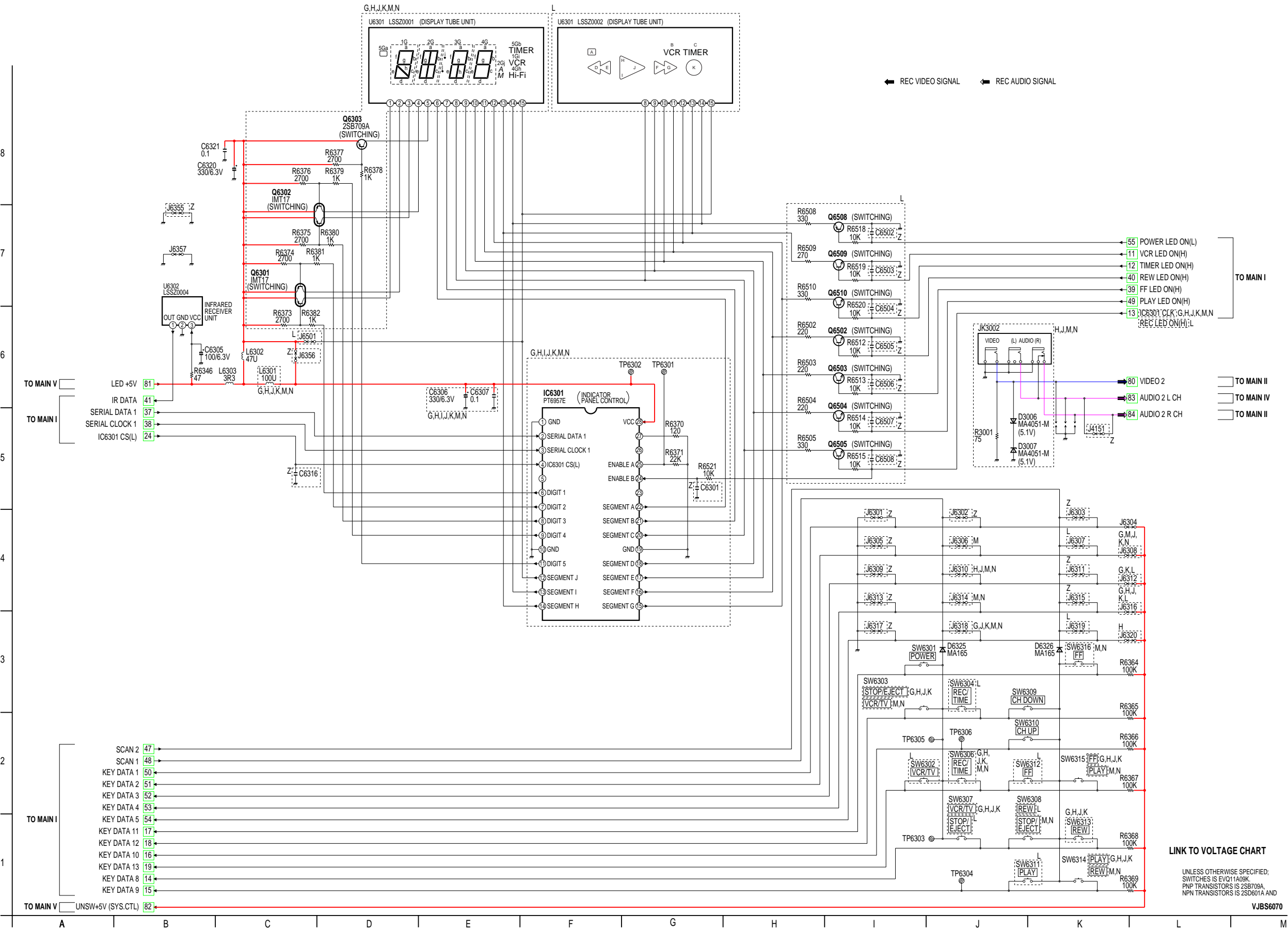
IC3001 VIDEO/AUDIO SIGNAL PROCESS / HEAD AMP IC- DETAIL BLOCK DIAGRAM, MN13400A



MAIN III (OPERATION) SCHEMATIC DIAGRAM (G, H, J, K, L, M, N)

NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS	
MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N
Not Used	Z



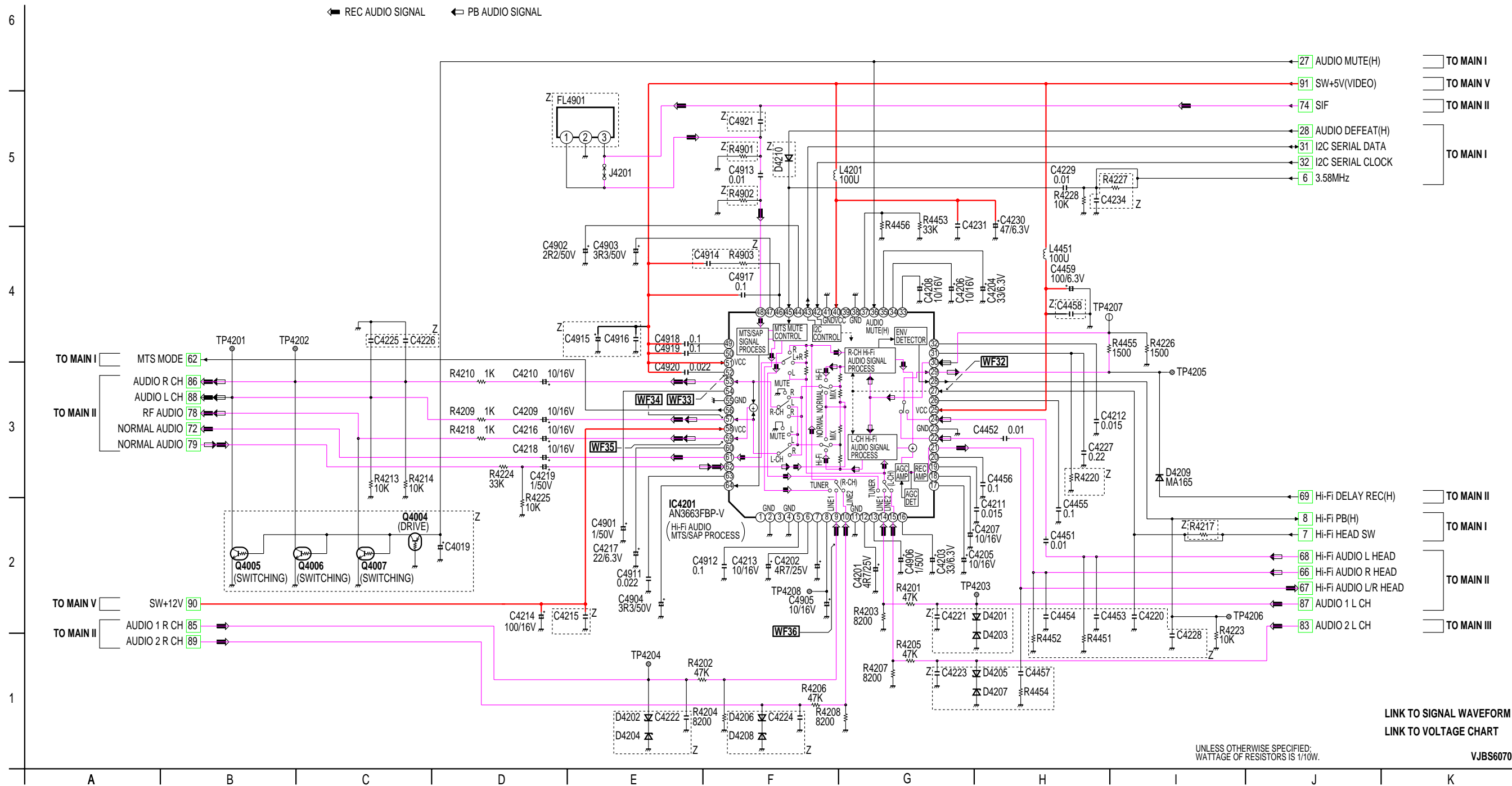
LINK TO VOLTAGE CHART

UNLESS OTHERWISE SPECIFIED;  
SWITCHES IS EVQ11A09K,  
PNP TRANSISTORS IS 2SB709A,  
NPN TRANSISTORS IS 2SD601A AND

VJBS6070

FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.

MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
	K
VHQ-451	L
PV-V4611	M
-----	N
Not Used	Z




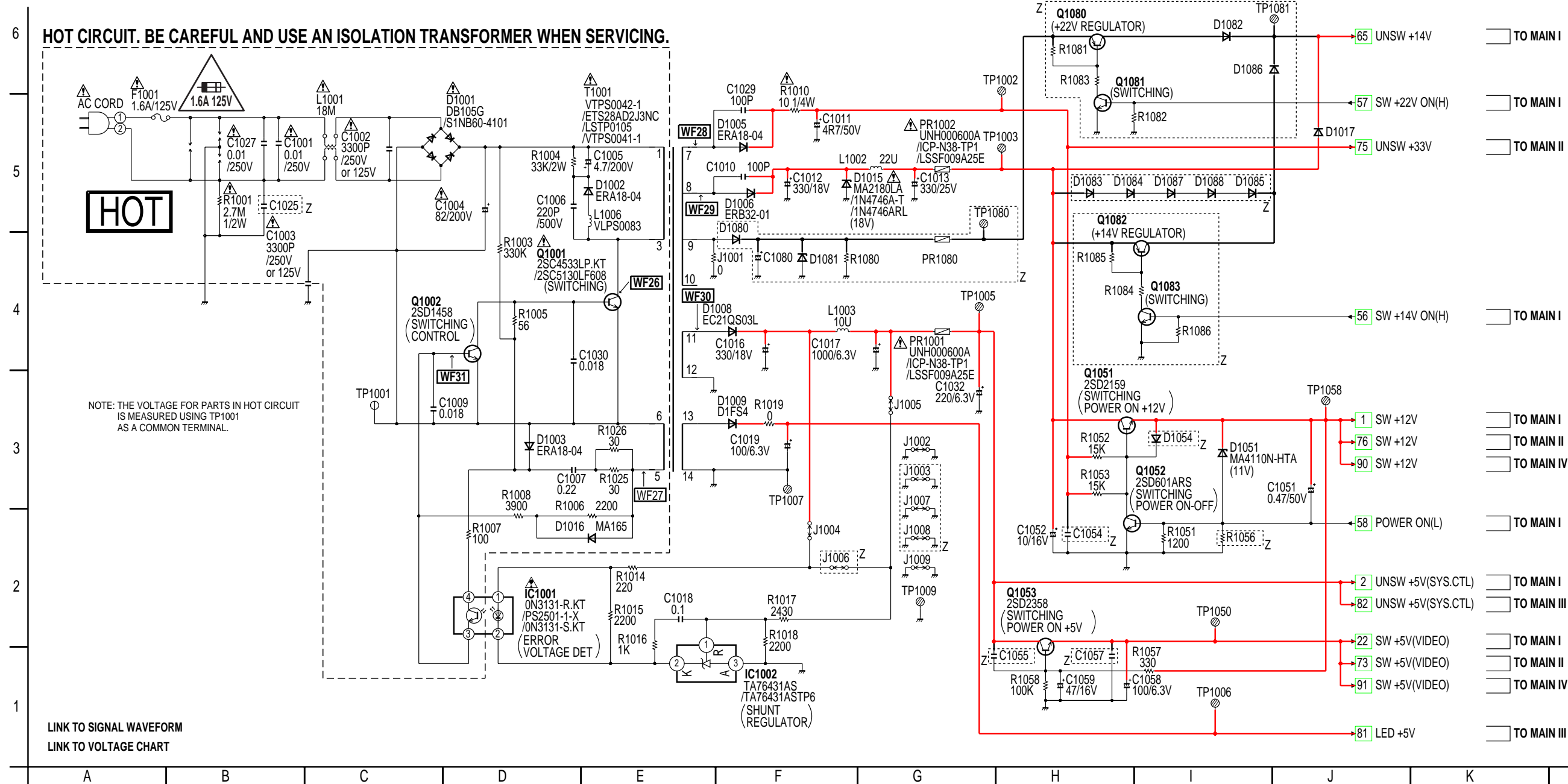
## MAIN V (POWER SUPPLY) SCHEMATIC DIAGRAM (G, H, J, K, L, M, N)

NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.

MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N
Not Used	Z

**CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,  
REPLACE ONLY WITH THE SAME TYPE 1.6A 125V FUSE.  
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES  
D'INCENDIE N'UTILISER QUE DES FUSIBLE DE MÊME  
TYPE 1.6A 125V**

**IMPORTANT SAFETY NOTICE:**  
COMPONENTS IDENTIFIED BY THE SIGN  HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.



**VJBS6070**

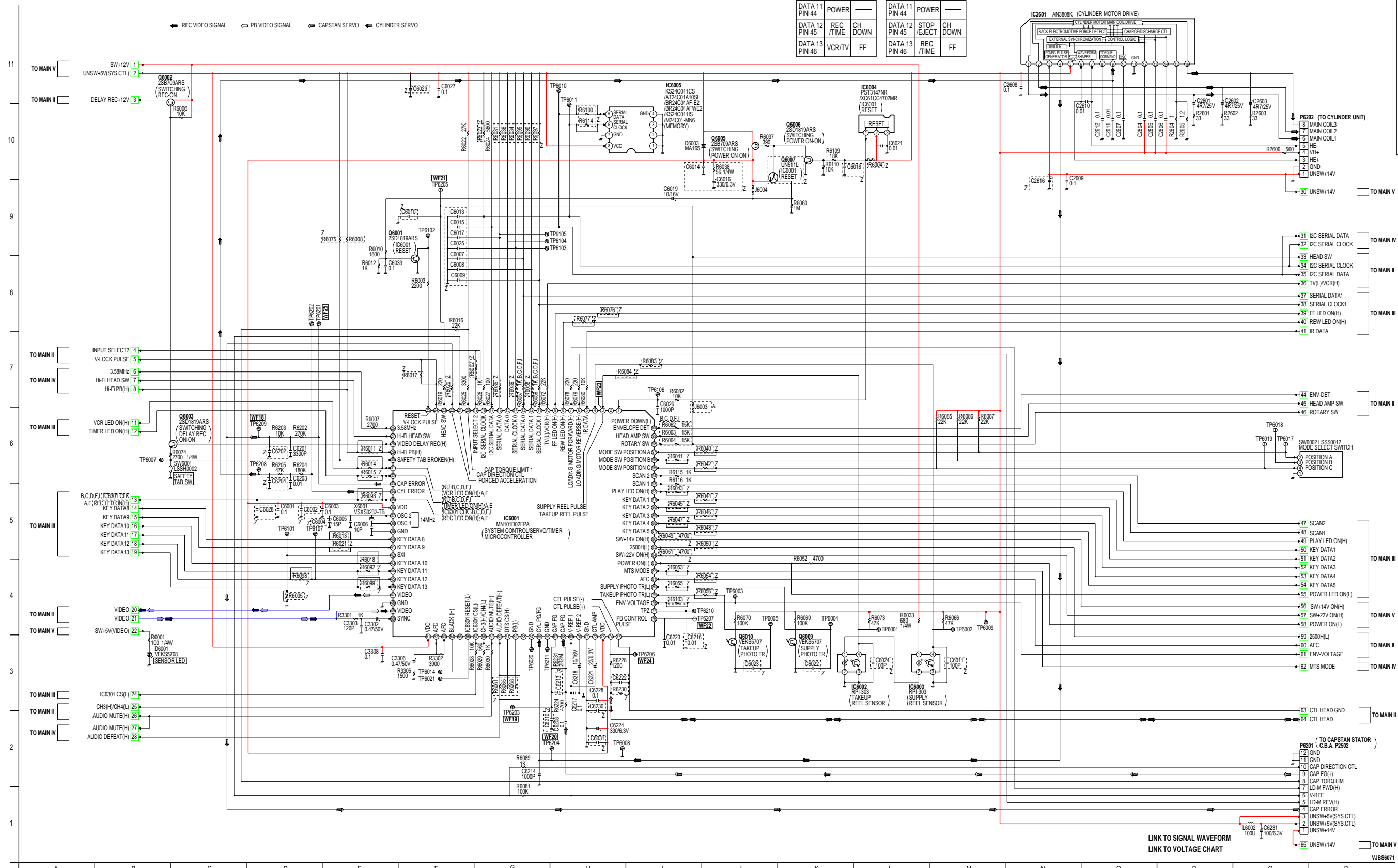
## MAIN I (SYSTEM CONTROL/ SERVO) SCHEMATIC DIAGRAM (A, B, C, D, E, F, I)

OUT IN	SCAN PIN 93
DATA 8 PIN 40	STOP /EJECT
DATA 9 PIN 41	—
DATA 10 PIN 43	—
DATA 11 PIN 44	POWER
DATA 12 PIN 45	REC /TIME
DATA 13 PIN 46	VCR/T

(Model: B, C, I)		
OUT IN	SCAN 1 PIN 93	SCAN 2 PIN 94
DATA 8 PIN 40	VCR/TV	REW
DATA 9 PIN 41	—	PLAY
DATA 10 PIN 43	—	CH UP
DATA 11 PIN 44	POWER	—
DATA 12 PIN 45	STOP /EJECT	CH DOWN
DATA 13 PIN 46	REC /TIME	FF

NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.

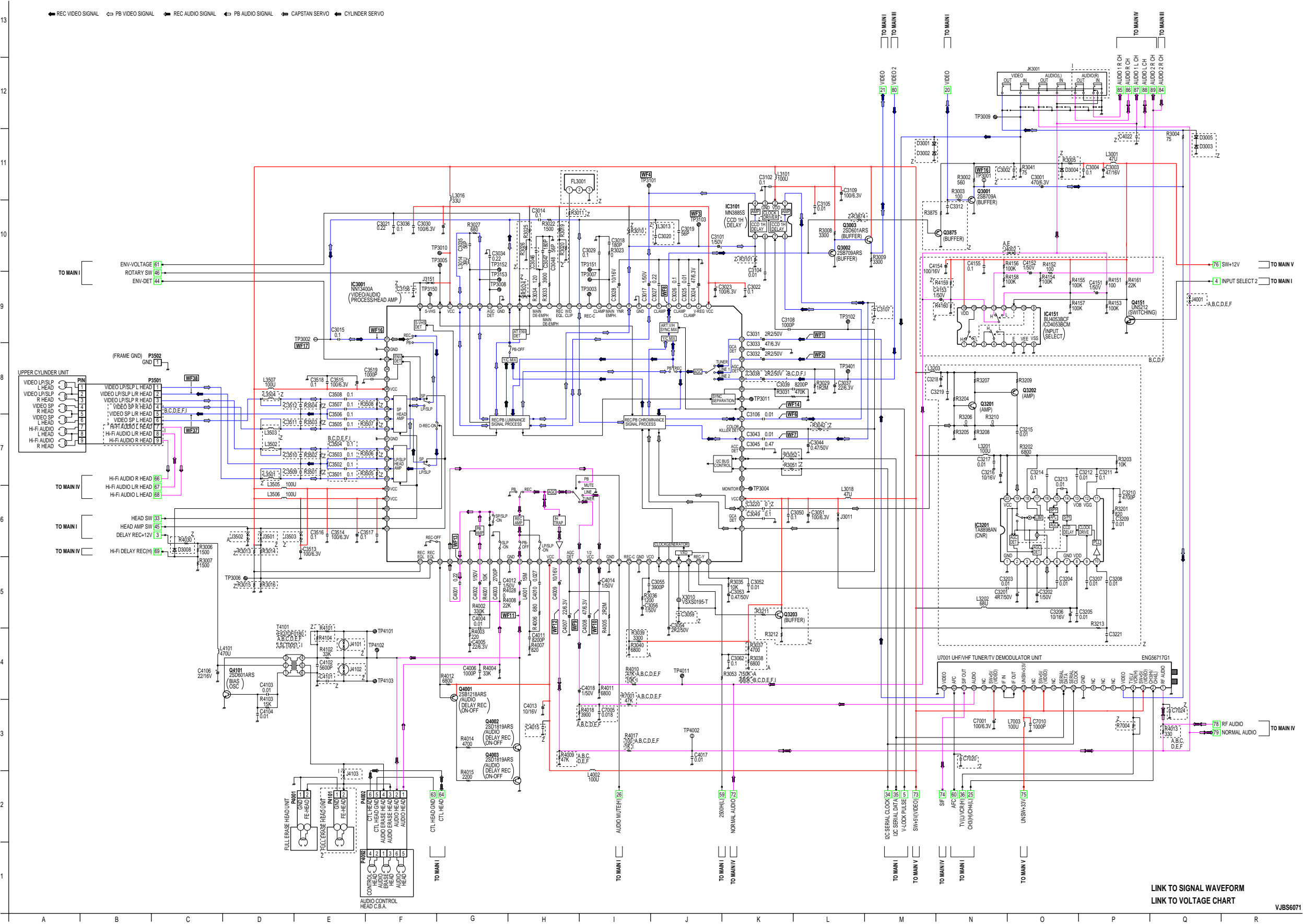
COMPARISON CHART OF MODELS & MARKS	
MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
	K
VHQ-451	L
PV-V4611	M
-----	N
Not Used	Z



MAIN II (SIGNAL PROCESS/AUDIO) SCHEMATIC DIAGRAM (A, B, C, D, E, F, I)

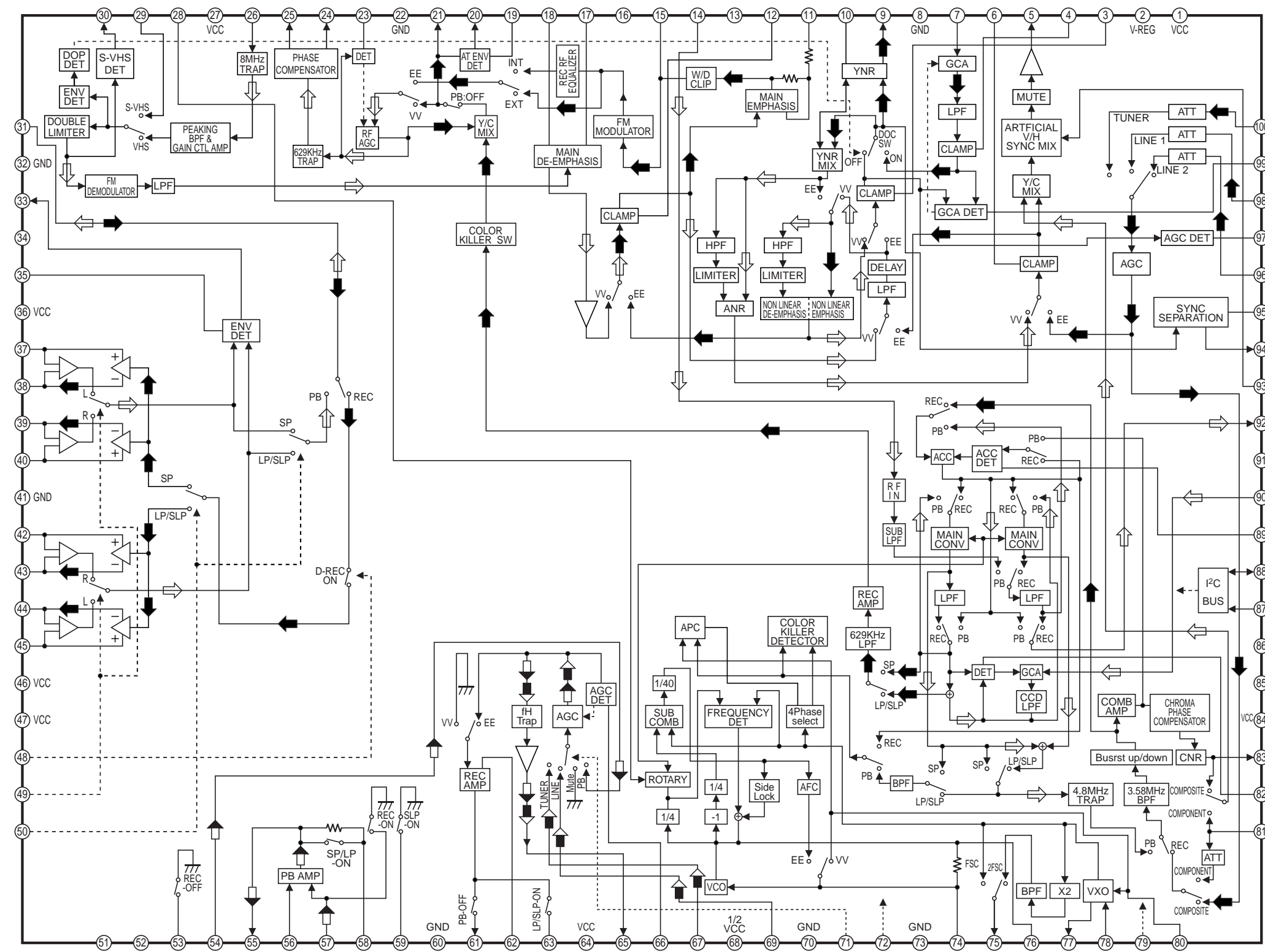
NOTE: FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N
Not Used	Z



LINK TO SIGNAL WAVEFORM  
LINK TO VOLTAGE CHART

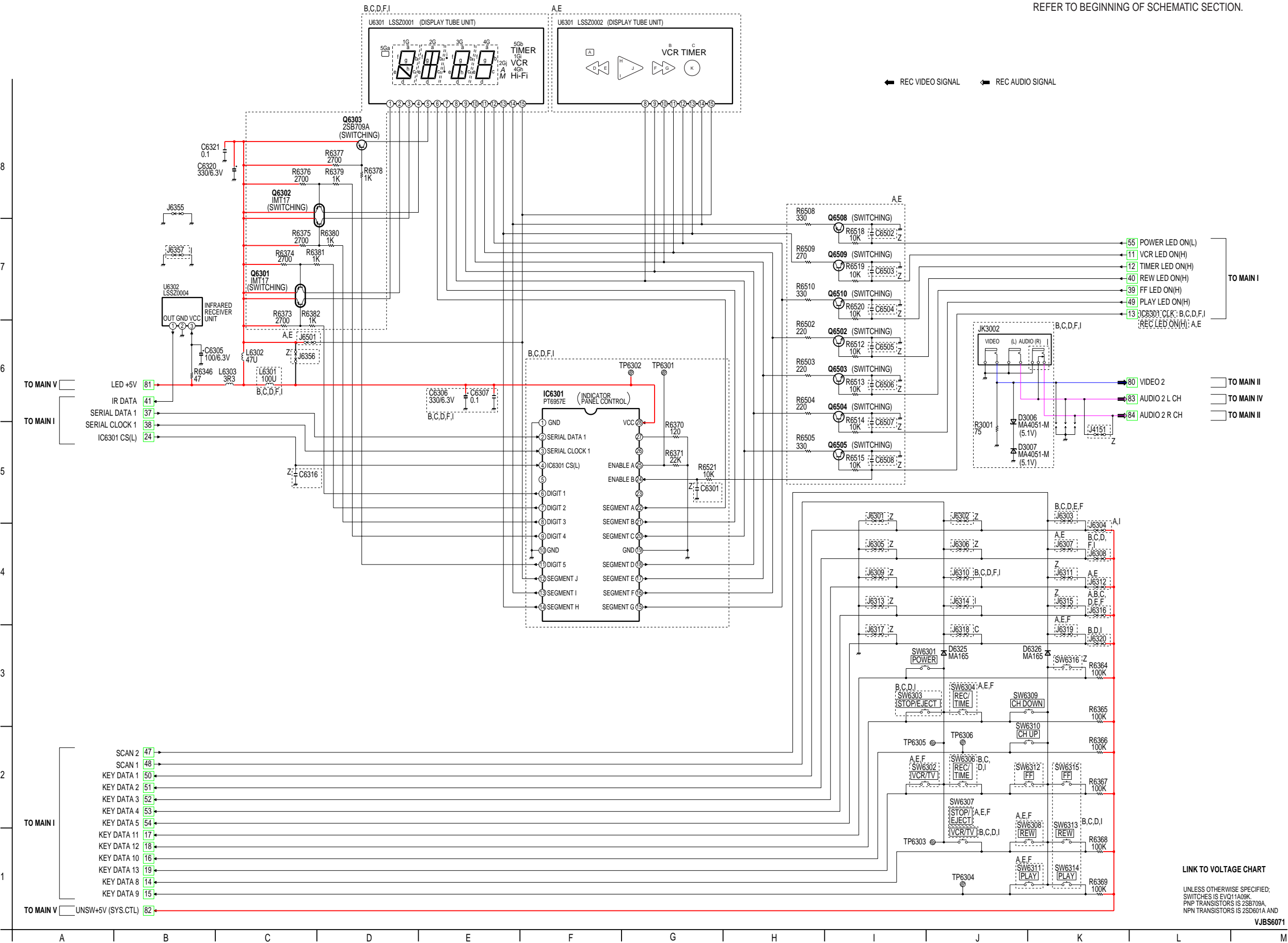
IC3001 VIDEO/AUDIO SIGNAL PROCESS / HEAD AMP IC- DETAIL BLOCK DIAGRAM, MN13400A



MAIN III (OPERATION) SCHEMATIC DIAGRAM (A, B, C, D, E, F, I)

NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS	
MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N
Not Used	Z



LINK TO VOLTAGE CHART

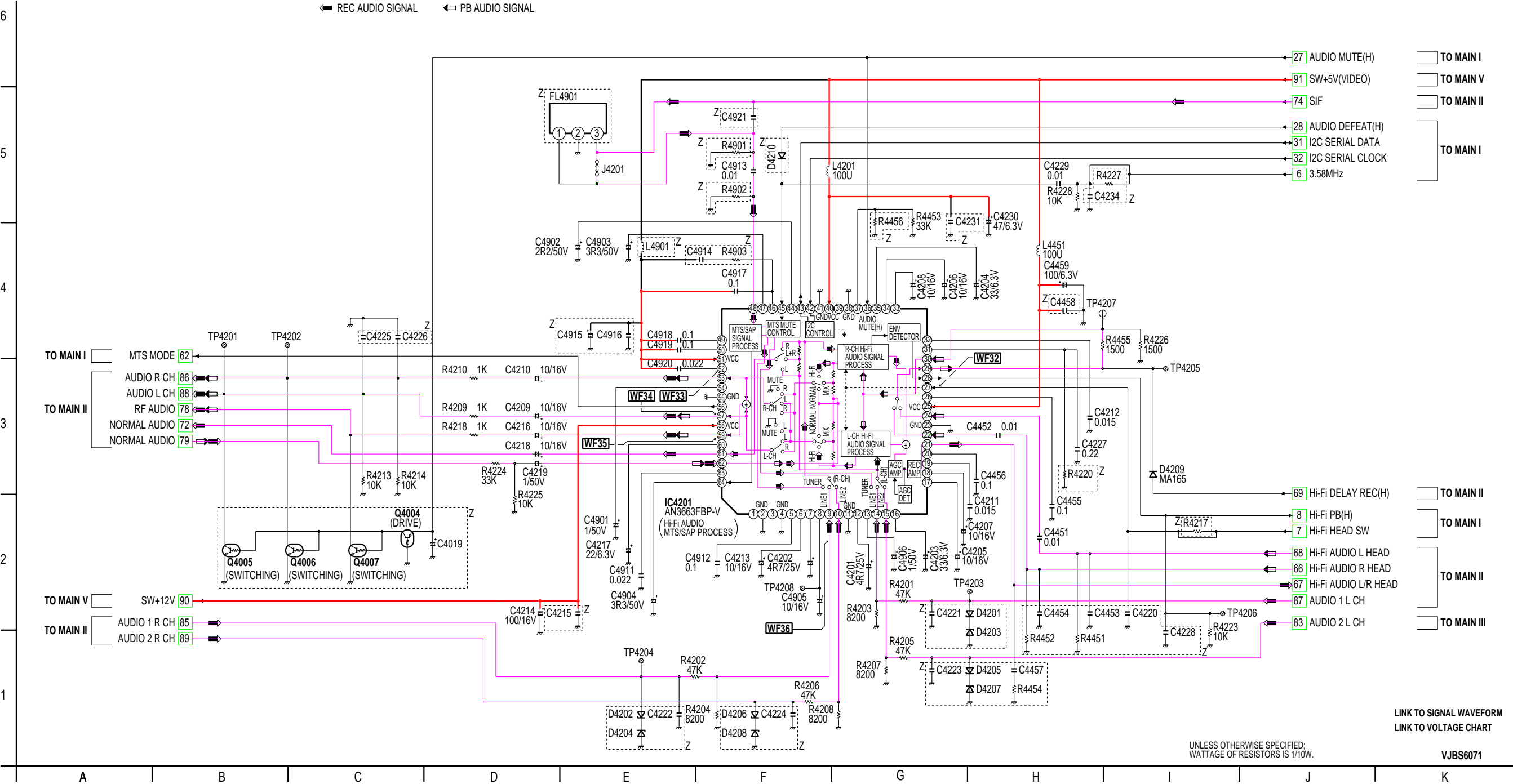
UNLESS OTHERWISE SPECIFIED;  
SWITCHES IS EVQ11A09K.  
PNP TRANSISTORS IS 2SB709A,  
NPN TRANSISTORS IS 2SD601A AND

VJBS6071

MAIN IV (Hi-Fi) SCHEMATIC DIAGRAM (I)

NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS	
MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N
Not Used	Z




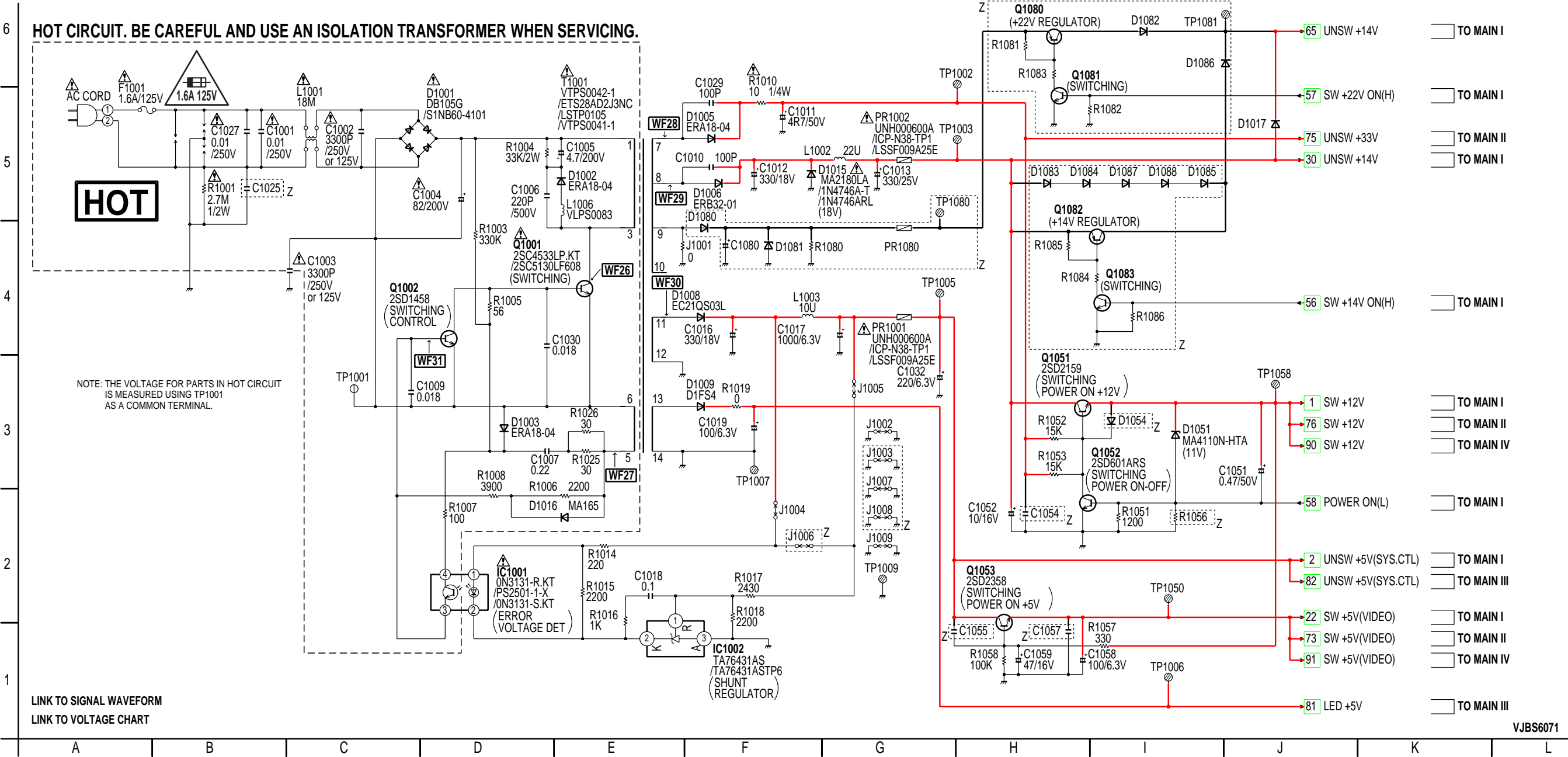
MAIN V (POWER SUPPLY) SCHEMATIC DIAGRAM (A, B, C, D, E, F, I)

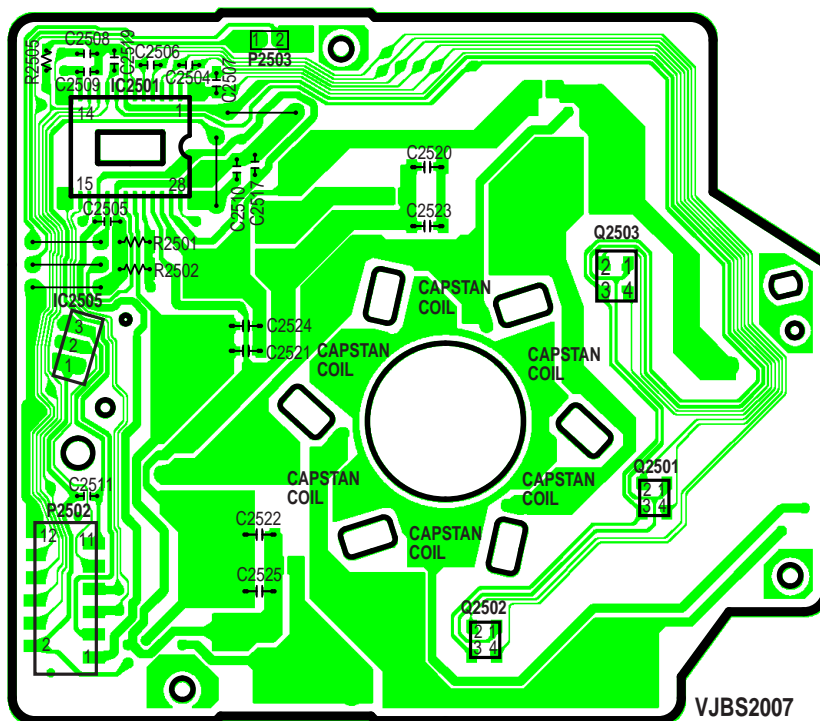
NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS	
MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N
Not Used	Z

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,  
REPLACE ONLY WITH THE SAME TYPE 1.6A 125V FUSE.  
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES  
D'T INCENDIE N' UTILISERQUE DES FUSIBLE DE MÊME  
TYPE 1.6A 125V

IMPORTANT SAFETY NOTICE:  
COMPONENTS IDENTIFIED BY THE SIGN  HAVE  
SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY.  
WHEN REPLACING ANY OF THESE COMPONENTS,  
USE ONLY THE SPECIFIED PARTS.





NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.

NOTE:  
CIRCUIT BOARD LAYOUT INCLUDES COMPONENTS WHICH ARE NOT USED.  
PLEASE REFER TO THE SCHEMATIC DIAGRAM AND PARTS LIST FOR PROPER PARTS CONTENT.


NOTE:  
WHEN INSTALLING THE IC2501(AN3846SC) OR CAPSTAN STATOR C.B.A.,  
BE SURE TO APPLY SILICON GREASE(VFK1301). REFER TO "CAPSTAN STATOR C.B.A."  
OF MACHANISM SECTION IN DISASSEMBLY/ASSEMBLY PROCEDURES.

NOTE:  
THE FOLLOWING PARTS ON THE CAPSTAN STATOR C.B.A. ARE NOT SUPPLIED SEPARATELY.  
PLEASE ORDER AND REPLACE WITH THE CIRCUIT BOARD ASSEMBLY INSTEAD OF INDIVIDUAL PARTS.  
(Q2501, Q2502, Q2503, CAPSTAN COIL)



CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,  
REPLACE ONLY WITH THE SAME TYPE 1.6A 125V FUSE.  
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES  
D'INCENDIE N'UTILISER QUE DES FUSIBLE DE MÊME  
TYPE 1.6A 125V



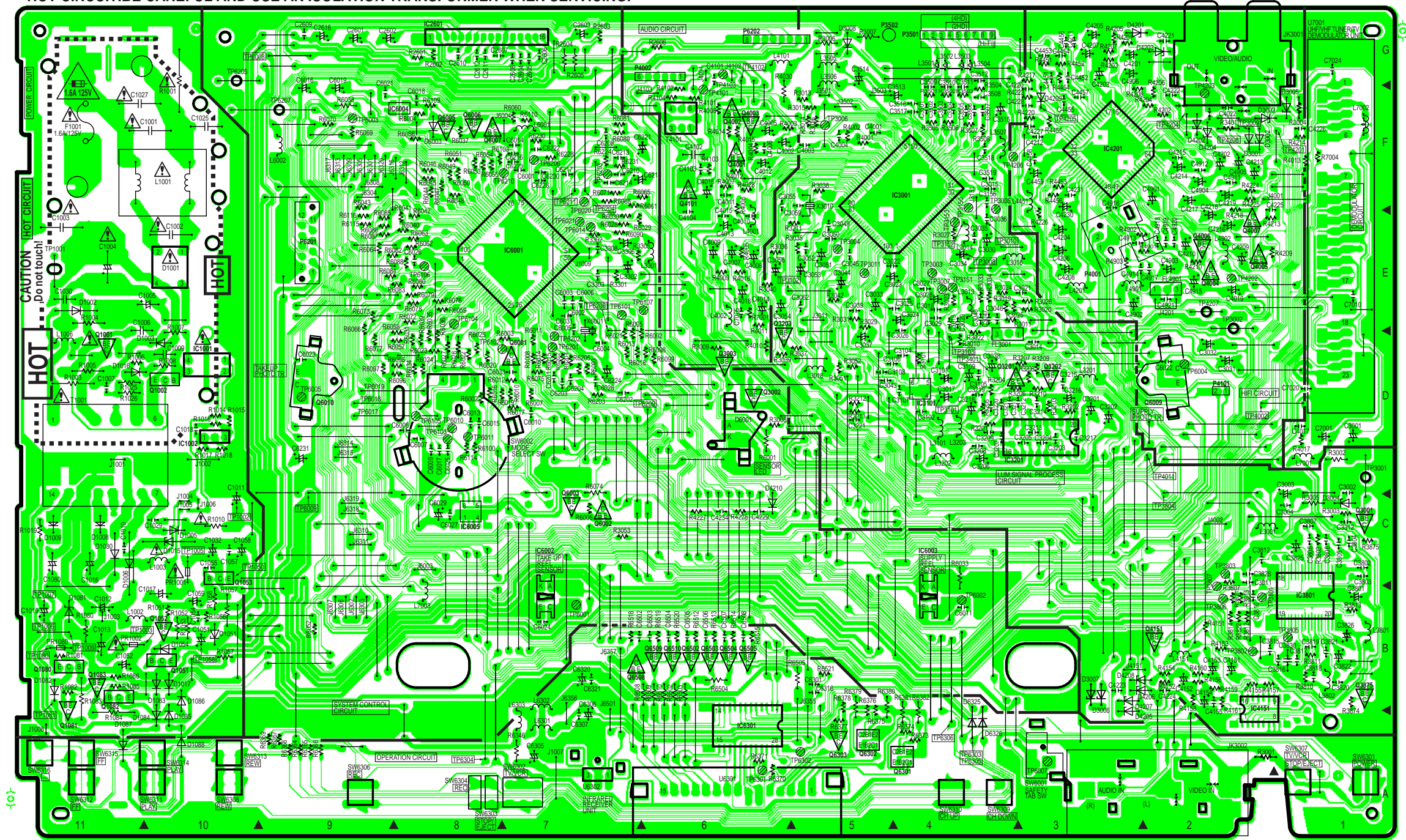
IMPORTANT SAFETY NOTICE:  
COMPONENTS IDENTIFIED BY THE SIGN  HAVE  
SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY.  
WHEN REPLACING ANY OF THESE COMPONENTS,  
USE ONLY THE SPECIFIED PARTS.

NOTE:  
CIRCUIT BOARD LAYOUT SHOWS COMPONENTS INSTALLED FOR VARIOUS MODELS.  
FOR PROPER PARTS CONTENT FOR THE MODEL YOU ARE SERVICING,  
PLEASE REFER TO THE SCHEMATIC DIAGRAM AND PARTS LIST.

NOTE:  
CIRCUIT BOARD LAYOUT INCLUDES COMPONENTS WHICH ARE NOT USED.

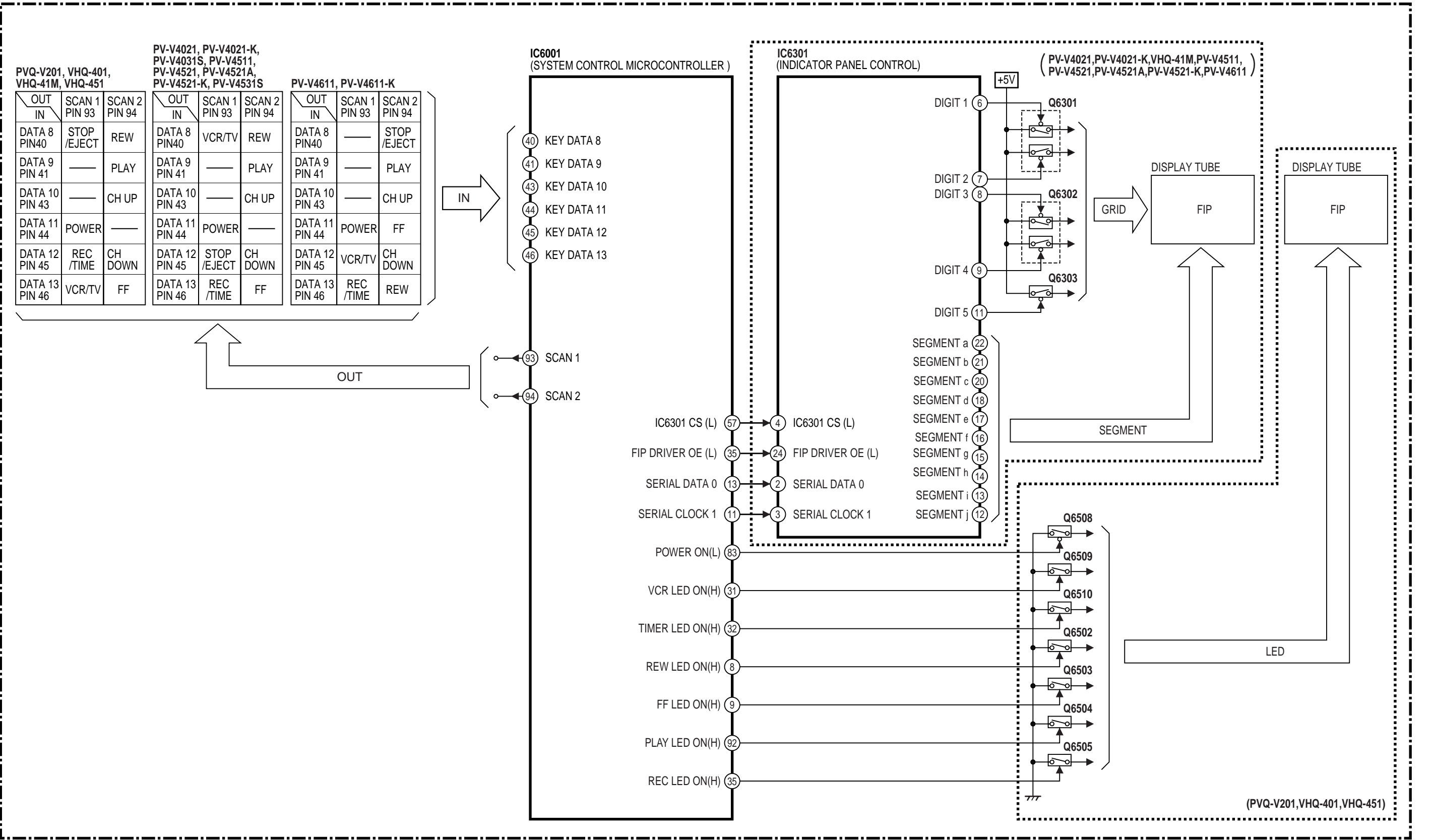
NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.

HOT CIRCUIT.BE CAREFUL AND USE AN ISOLATION TRANSFORMER WHEN SERVICING.

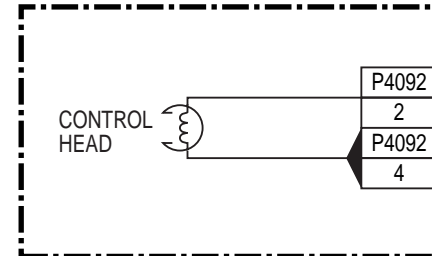


COMPARISON CHART  
OF MODELS & MARKS

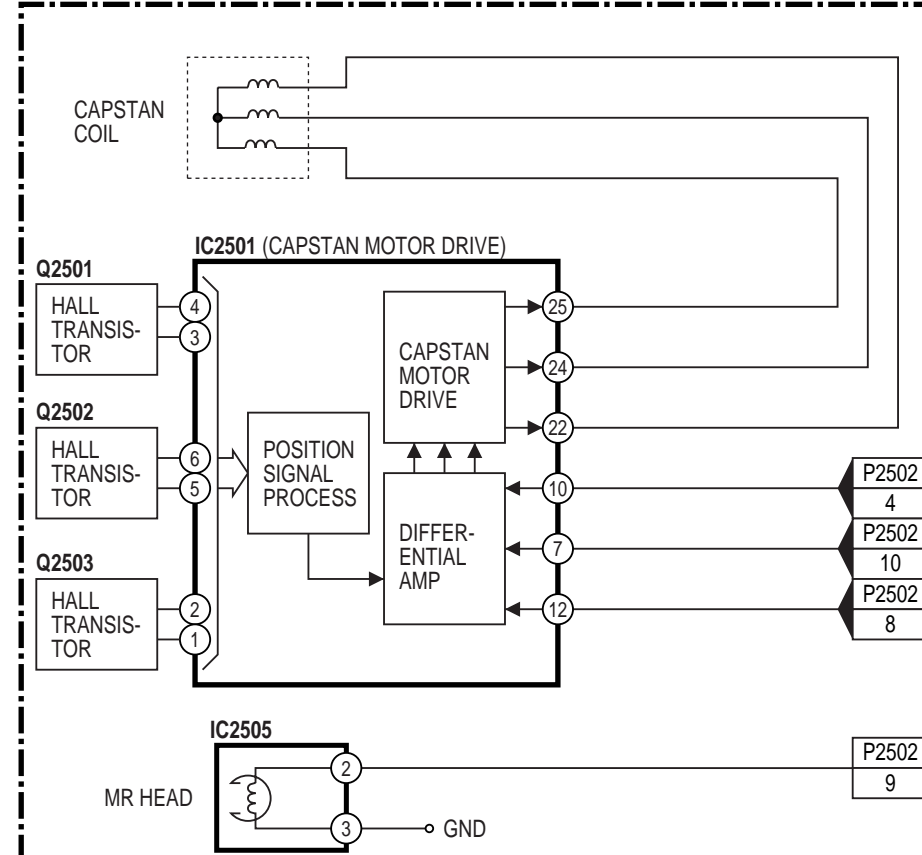
MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N



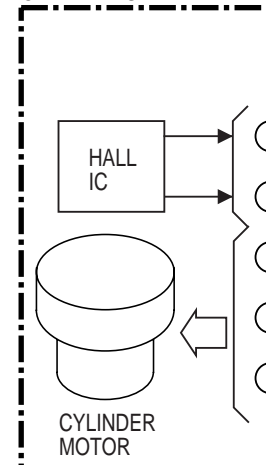
# AUDIO CONTROL HEAD UNIT



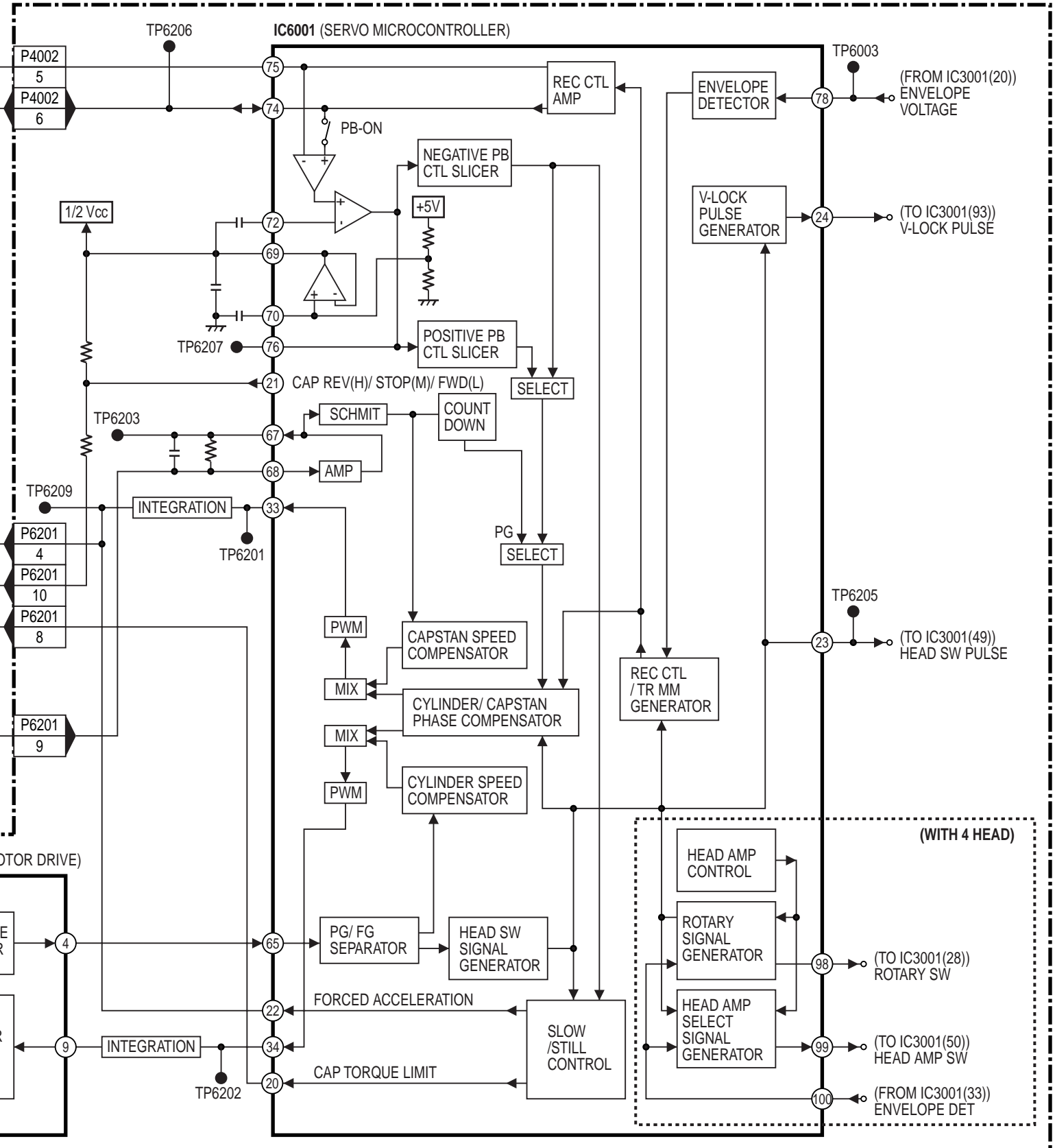
# CAPSTAN STATOR C.B.A.



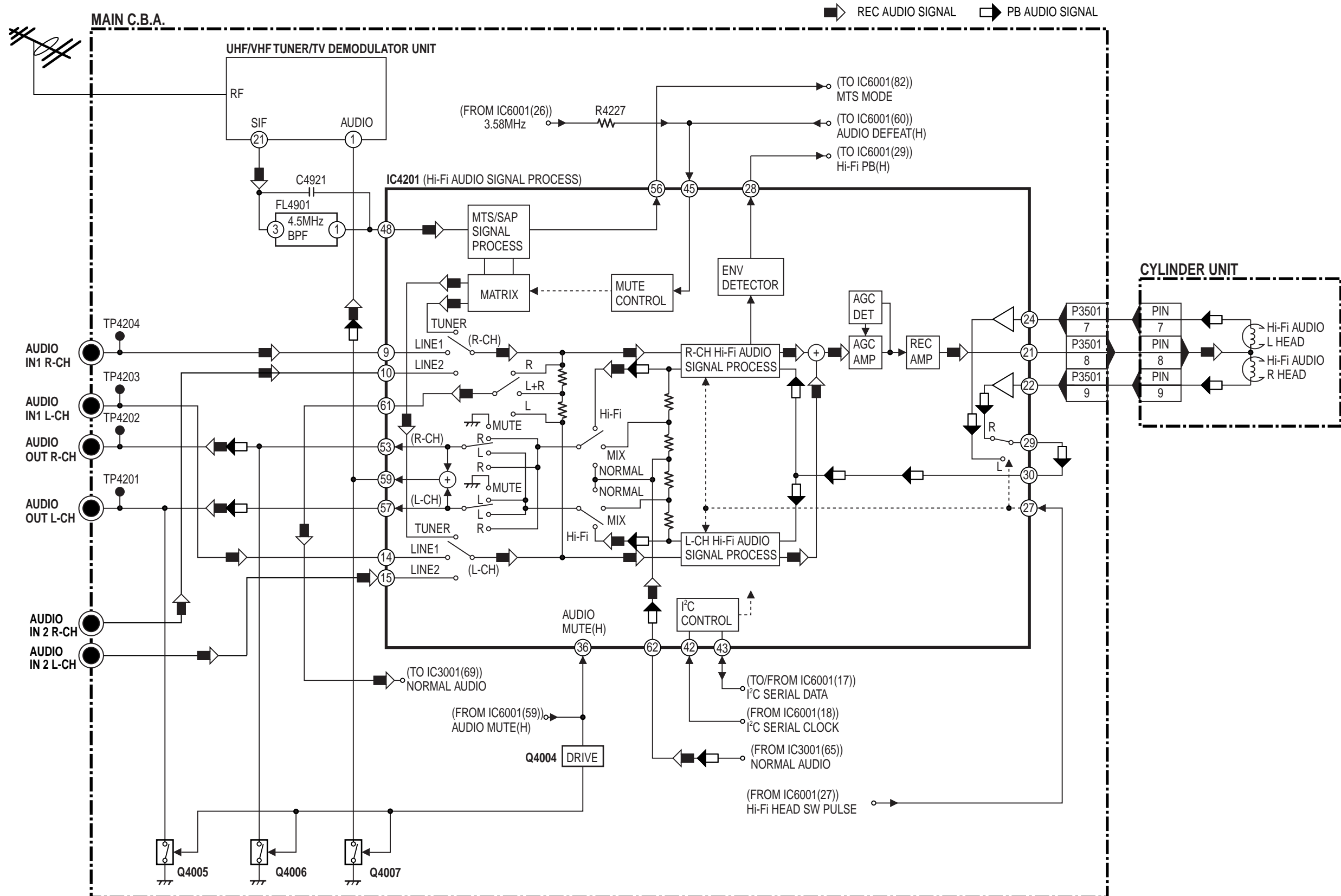
# CYLINDER UNIT

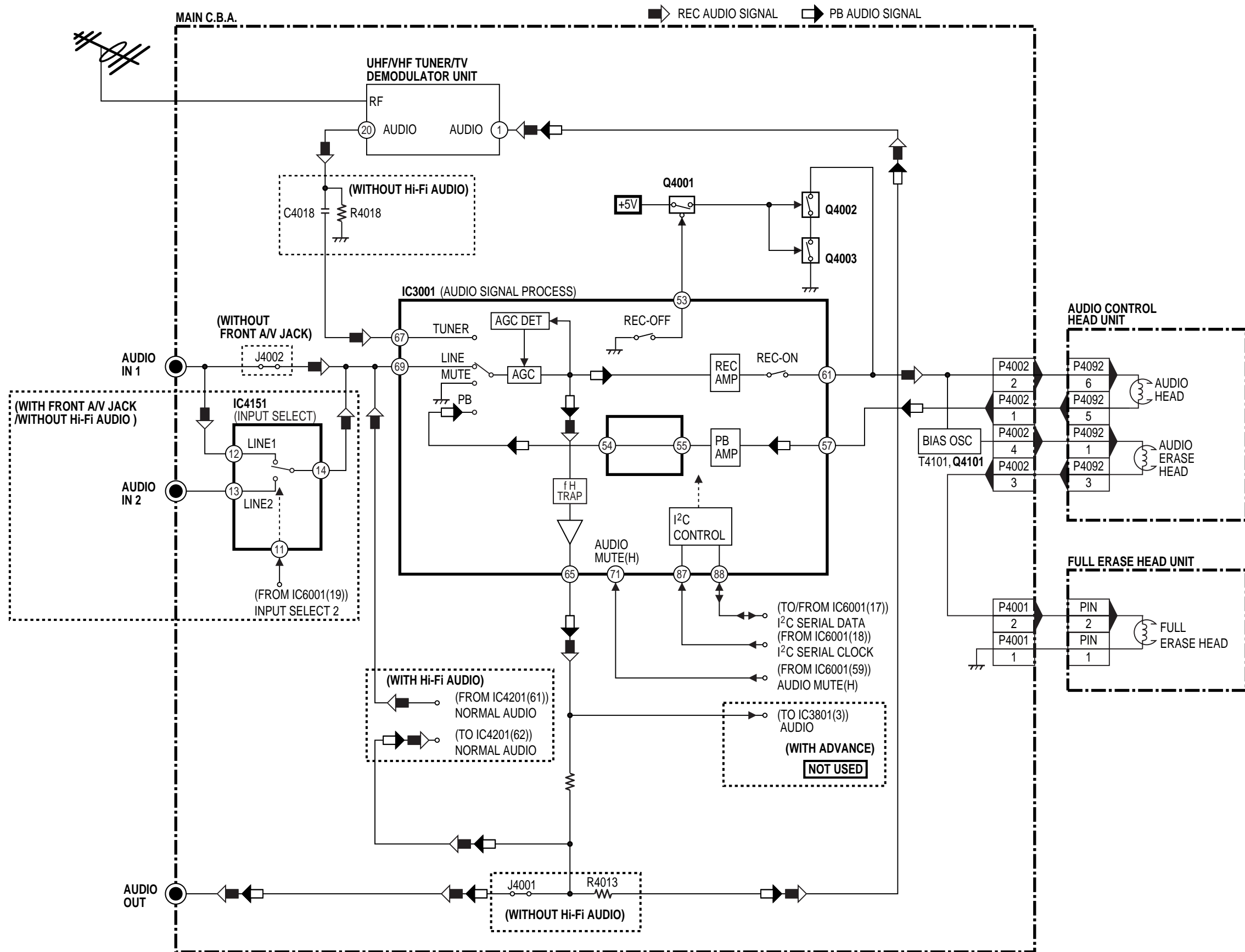


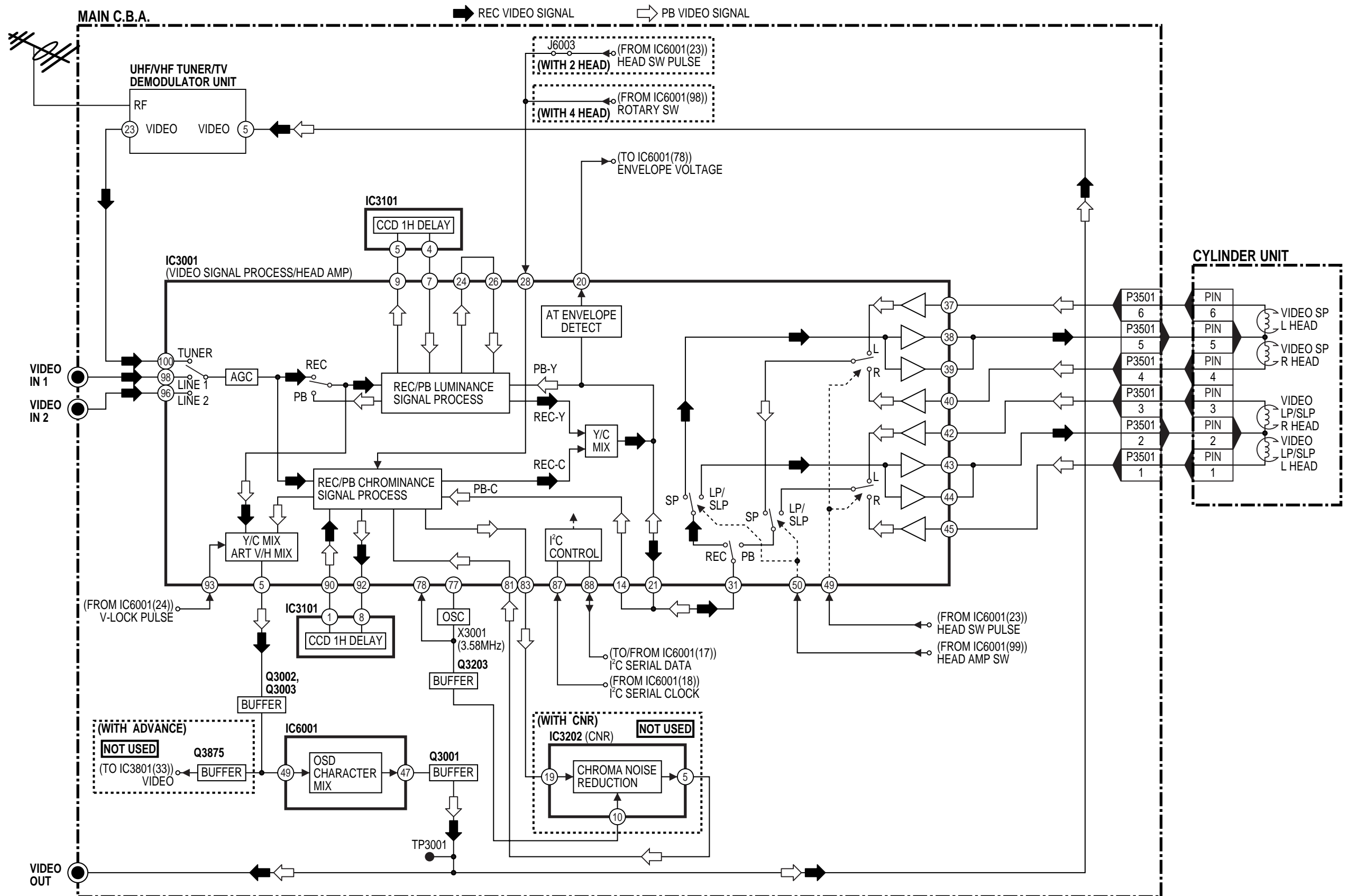
# MAIN C.B.A.



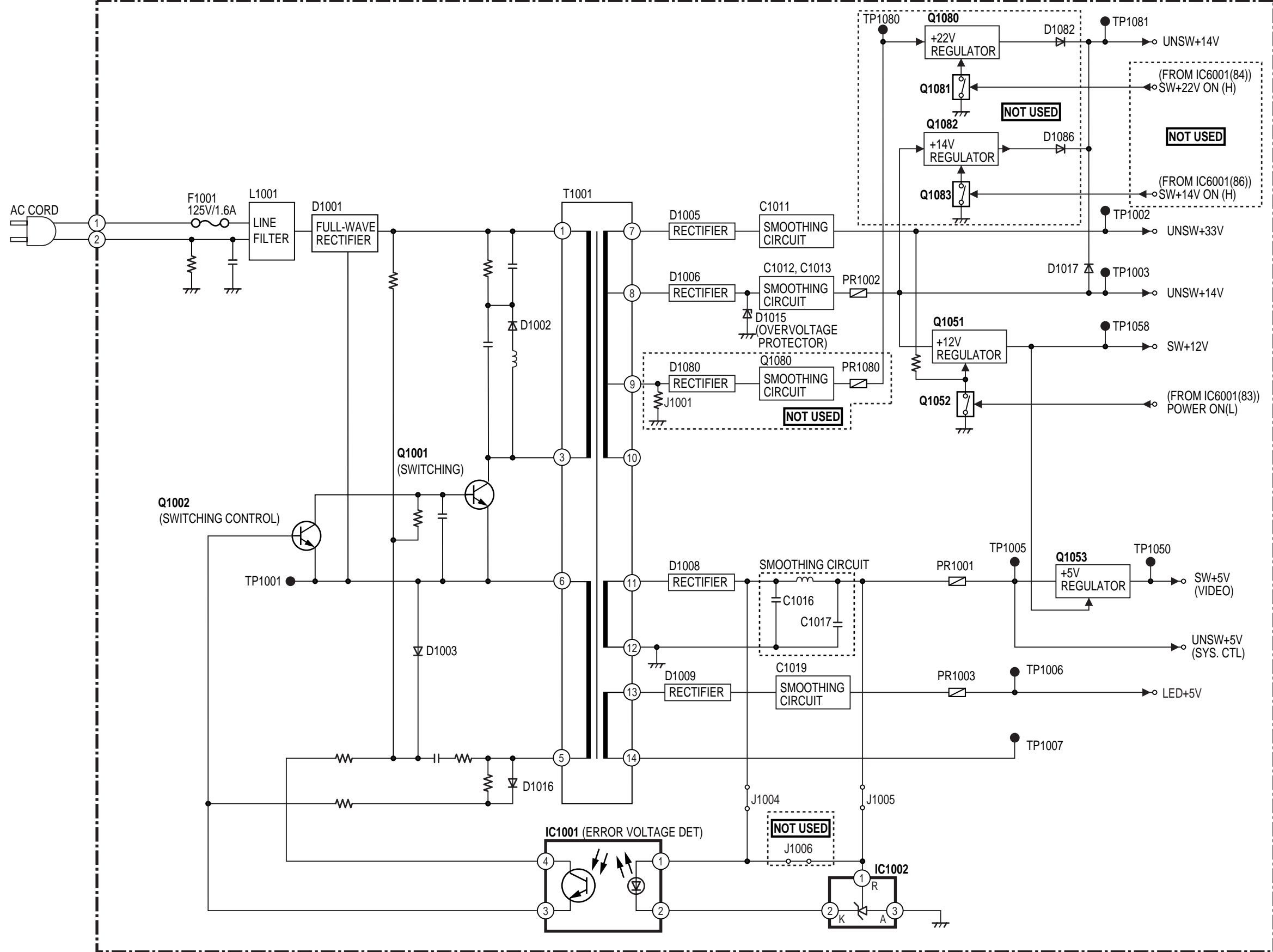




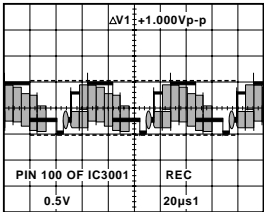




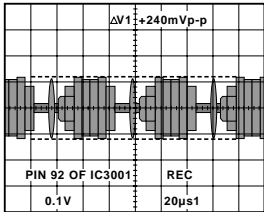
The schematic diagram illustrates the power supply section of the IC6001 receiver. It begins with a 125V/1.6A fuse (F1001) and a line filter (L1001) connected to a full-wave rectifier (D1001). The rectified output is filtered by a network of capacitors and diodes (D1002, D1003, D1016) and then fed into a transformer (T1001). The transformer has 14 secondary windings, each connected to a different rectifier (D1005, D1006, D1008, D1009, D1080) and smoothing circuit (C1011, C1012, C1013, C1016, C1017, C1019). The outputs are regulated by various ICs: Q1080 (+22V), Q1082 (+14V), Q1051 (+12V), Q1053 (+5V), and Q1002 (switching control). The circuit also includes an error voltage detector (IC1001) and a relay (IC1002) for switching. Various test points (TP1001 to TP1007) and components (Q1001, Q1081, Q1083, Q1052) are shown. Some components are marked as 'NOT USED'.



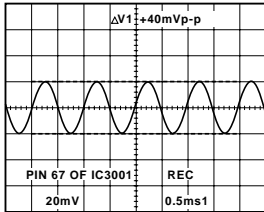
NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.



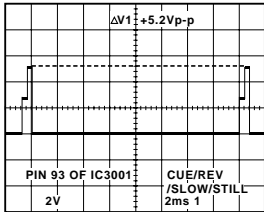
WF1



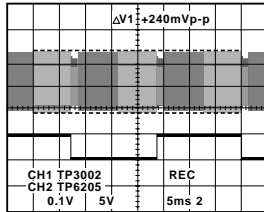
WF6



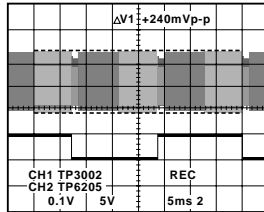
WF9



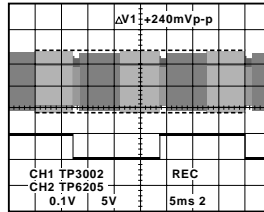
WF14



CH1 WF17 (A)  
CH2 WF21 (A)

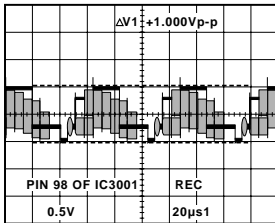


CH1 WF17 (B,C,D,E,F)  
CH2 WF21 (B,C,D,E,F)

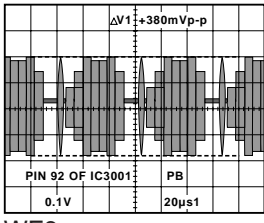


CH1 WF17 (G,H,I,J,K,L,M,N)  
CH2 WF21 (G,H,I,J,K,L,M,N)

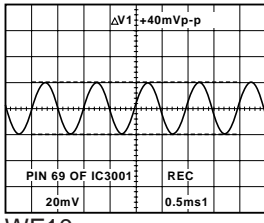
COMPARISON CHART OF MODELS & MARKS	
MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N



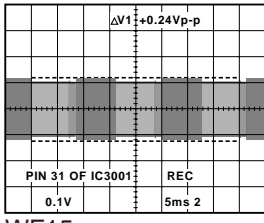
WF2



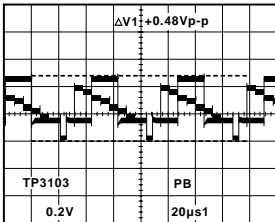
WF6



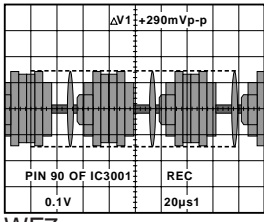
WF10



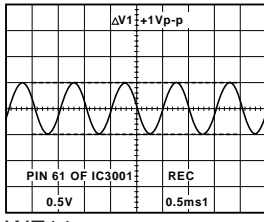
WF15



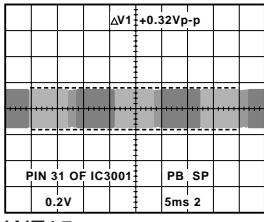
WF3



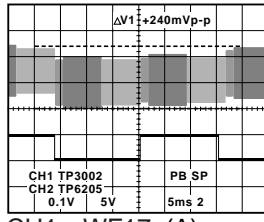
WF7



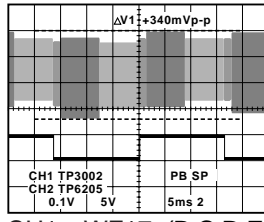
WF11



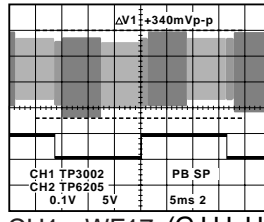
WF15



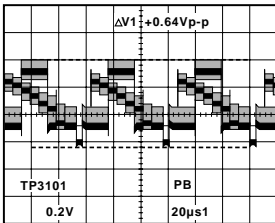
CH1 WF17 (A)  
CH2 WF21 (A)



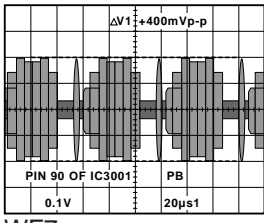
CH1 WF17 (B,C,D,E,F)  
CH2 WF21 (B,C,D,E,F)



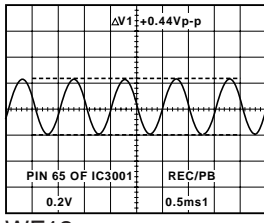
CH1 WF17 (G,H,I,J,K,L,M,N)  
CH2 WF21 (G,H,I,J,K,L,M,N)



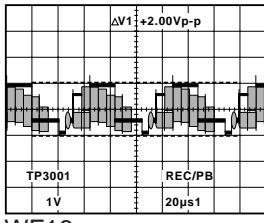
WF4



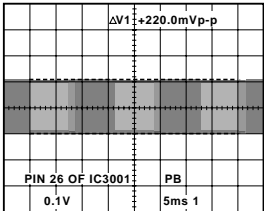
WF7



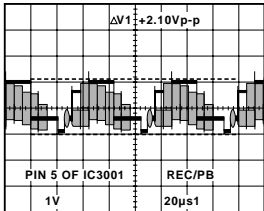
WF12



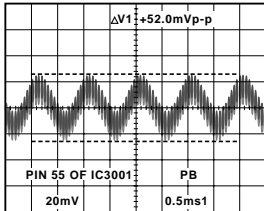
WF16



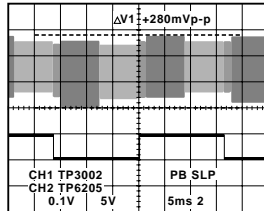
WF5



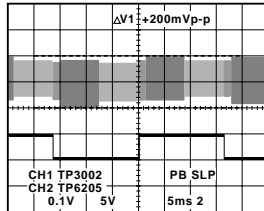
WF8



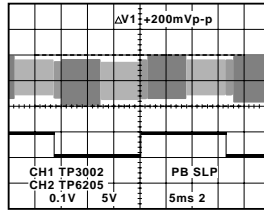
WF13



CH1 WF17 (A)  
CH2 WF21 (A)

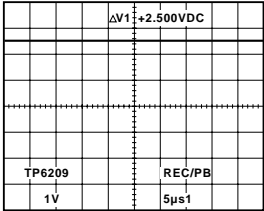


CH1 WF17 (B,C,D,E,F)  
CH2 WF21 (B,C,D,E,F)

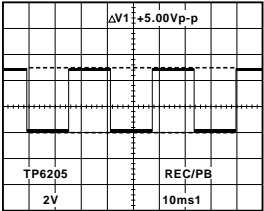


CH1 WF17 (G,H,I,J,K,L,M,N)  
CH2 WF21 (G,H,I,J,K,L,M,N)

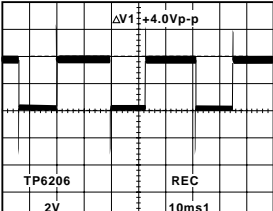
NOTE:  
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,  
REFER TO BEGINNING OF SCHEMATIC SECTION.



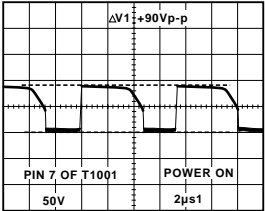
WF18



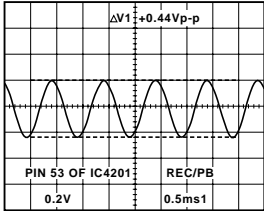
WF21



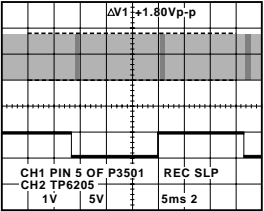
WF24



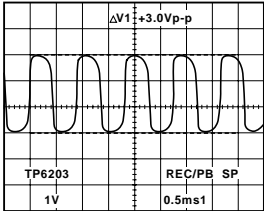
WF28



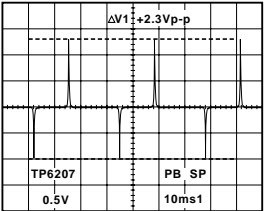
WF33 (G,H,I,J,K,L,M,N)



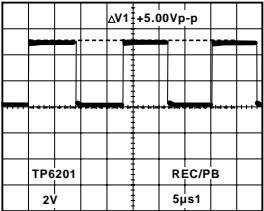
CH1 WF37 (A)  
CH2 WF21 (A)



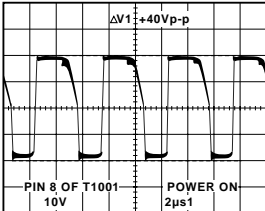
WF19



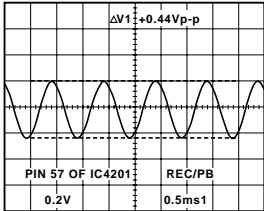
WF22



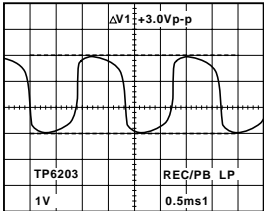
WF25



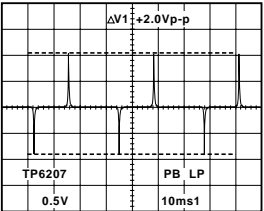
WF29



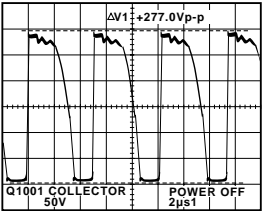
WF34 (G,H,I,J,K,L,M,N)



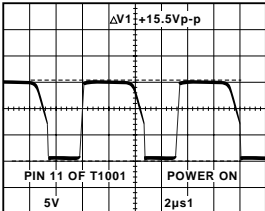
WF19



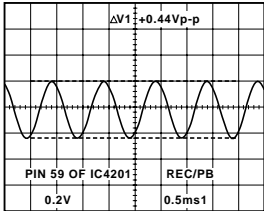
WF22



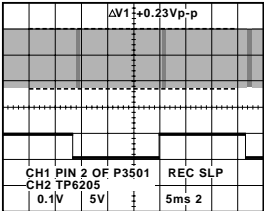
WF26



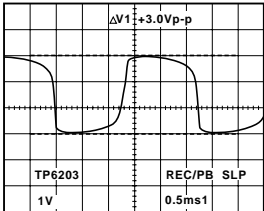
WF30



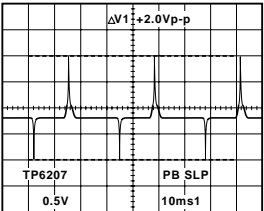
WF35 (G,H,I,J,K,L,M,N)



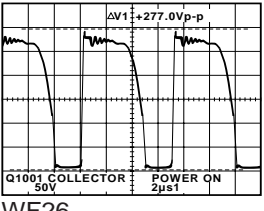
CH1 WF38 (B,C,D,E,F,G,H,I,J,K,L,M,N)  
CH2 WF21 (B,C,D,E,F,G,H,I,J,K,L,M,N)



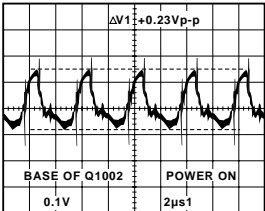
WF19



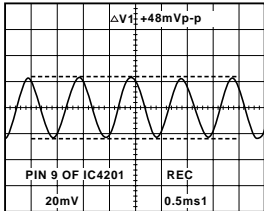
WF22



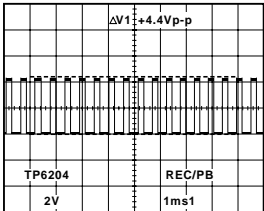
WF26



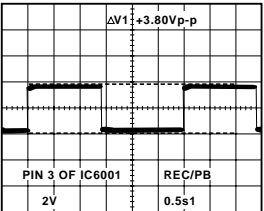
WF31



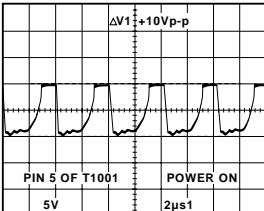
WF36 (G,H,I,J,K,L,M,N)



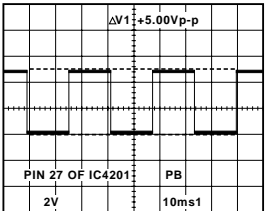
WF20



WF23



WF27



WF32 (G,H,I,J,K,L,M,N)

COMPARISON CHART  
OF MODELS & MARKS

MODEL	MARK
PVQ-V201	A
PV-V4021	B
PV-V4021-K	C
-----	D
VHQ-401	E
VHQ-41M	F
PV-V4511	G
PV-V4521	H
PV-V4521A	I
PV-V4521-K	J
-----	K
VHQ-451	L
PV-V4611	M
-----	N

ORDER NO. MKE0107010S1

B3

# Service Manual

Video Cassette Recorder



PVQ-V201 / PV-V4021 / PV-V4021-K / PV-V4521A / PV-V4621-K /  
VHQ-401 / VHQ-41M / PV-V4511 / PV-V4521 / PV-V4521-K  
PV-V4531-K / PV-451-K / PV-V4601 / PV-V4611 / VHQ-451 / PV-V4621 / PV-  
V4661-K / PV-VS4821 / PV-VS4821-K

## Main circuit board Modification

Please use this manual together with the Service Manual for Order No. MKE0101000C1, MKE0101001C1, MKE0101002C1, MKE0101003C1.

© 2001 Matsushita Kotobuki Electronics Industries LTD. All rights reserved. Unauthorized copying and distribution is a violation of law.

### WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

**Panasonic® / Quasar®**

## 1. Main circuit board Modification

Following modification (addition of filter) has been introduced to Main C.B.A. on running change basis to filter the excessively high FBT electromagnetic emission from certain TV.

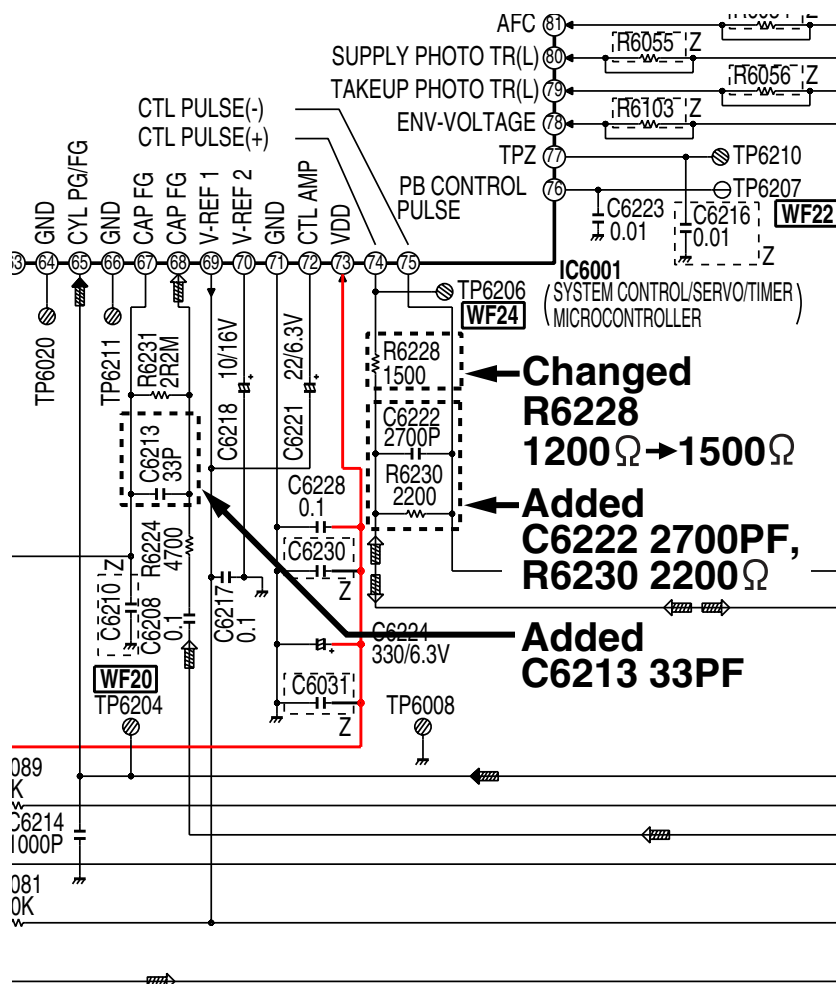
### 1.1. Replacement Parts List

### Part Change Information

Interchangeability Code: See the I/C column on the following Part Number List.															
	Parts/Set Production				Parts/Set Production				Parts/Set Production				Parts/Set Production		
A	Original	→	Early	B	Original	→	Early	C	Original	→	Early	D	Original	→	Early
	New	→	Late		New	→	Late		New	→	Late		New	→	Late
E	Addition			F	Deletion			G	Other						
Part No.															
Ref. No.	Original Part No.			New Part No.			Part Name				I/C	Remarks			
R6228	ERJ6GEYJ122V			ERJ6GEYJ152V			MGF CHIP		1/10W	1.5K	B				
R6230	-----			ERJ6GEYJ222V			MGF CHIP		1/10W	2.2K	E				
C6213	-----			ECUV1H330JCN			C CHIP		50V	33PF	E				
C6222	-----			ECUV1H272KBKN			C CHIP		50V	2700PF	E				

## 1.2. Schematic Diagram & Circuit Board Layout

## Main C.B.A. Partial Circuit Board Layout



- Added C6222 2700PF, R6230 2200Ω
- Added C6213 33PF
- Changed R6228 1200Ω→1500Ω